Chemical Week

January 12, 1957

Price 35 cents

State legislatures have a raft of chemical bills on their dockets. Here are the highlights . . . p. 21

Cords of oak bark help tanner streamline ancient art. Prospect: new tannin process . . . . . p. 54

New property insurance plan gives manufacturer coverage for less cost . . . . . p. 31

Ammonia glut: Capacity is way ahead of demand—and new plants are coming in this year . . . p. 64

Test marketing makes sense to specialties men. Small-scale try-outs can prevent big mistakes . p. 74

E P POWER
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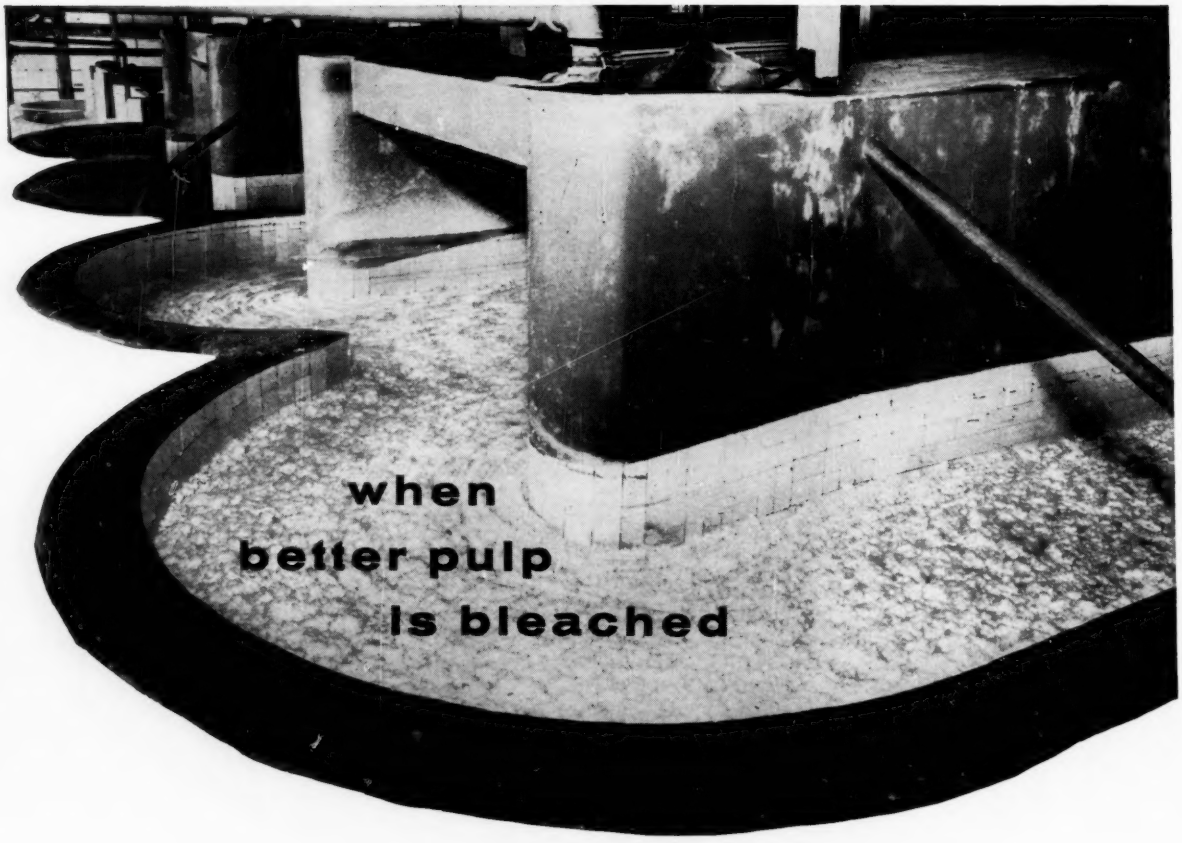

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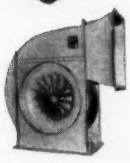

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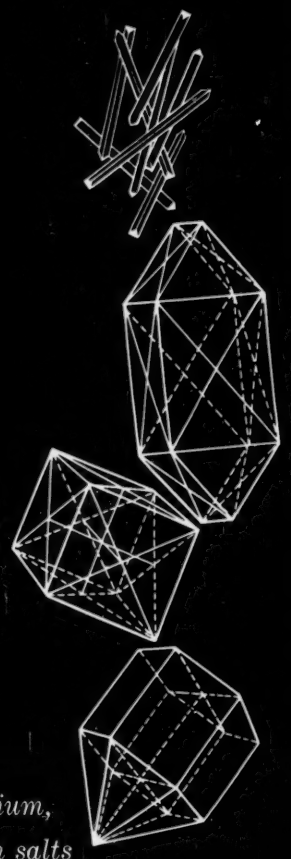

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Chemical Week

TOP OF THE WEEK

January 12, 1957

Did chemical stock purchases by institutional investors overinflate stock values? Here's what a Senate study shows ..... p. 22

The U.S. has finally sold the Texas City tin smelter, Wah Chang Corp. bought it for use in producing tin and tungsten ..... p. 23

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23 Construction of that Florida gas pipeline can begin, now that FPC has given its okay

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80 New polymer-base floor wax makes its debut in Northeast

The SUPERIORITY of Ace Glassware Design is Typified in

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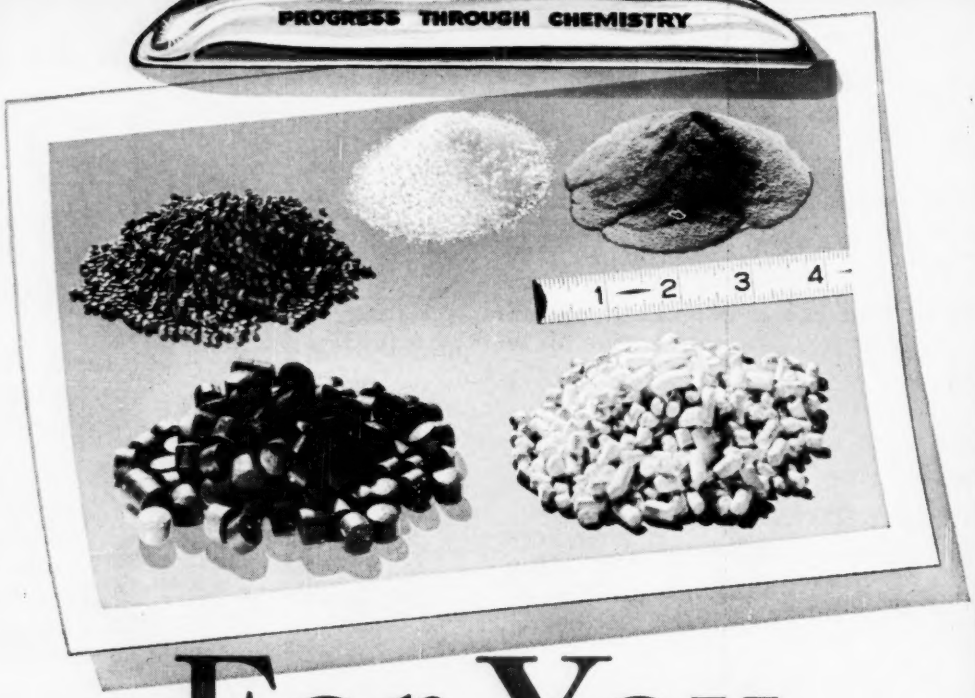

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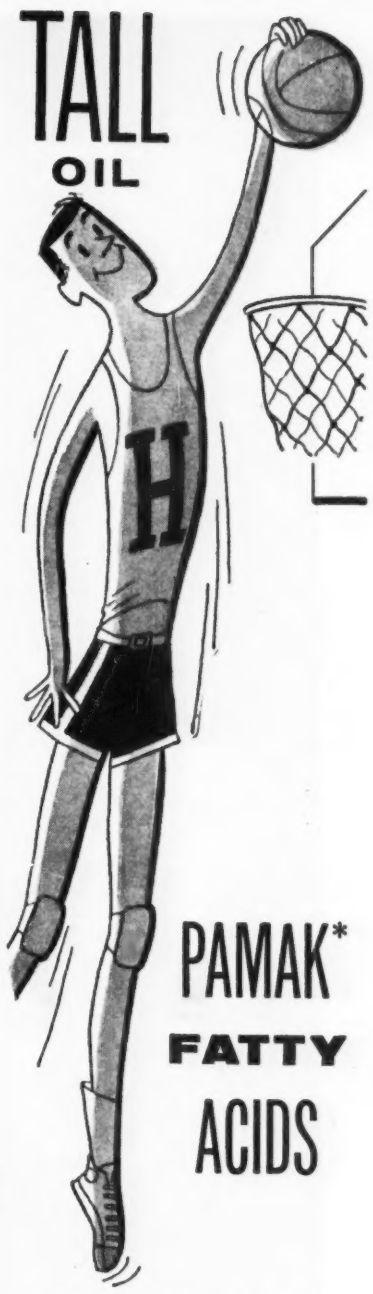

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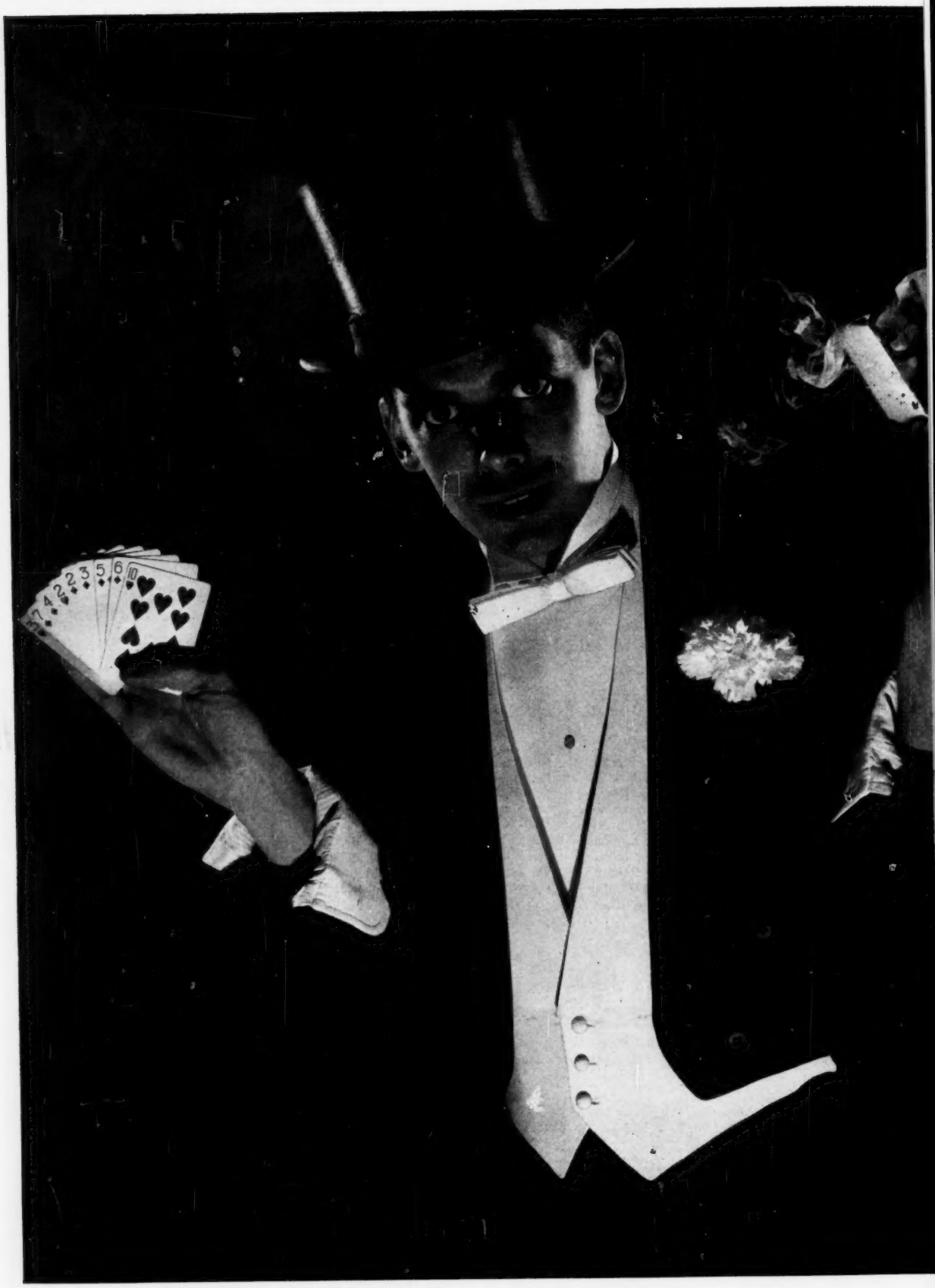

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OPINION

Wrong Naphthylacetamide

TO THE EDITOR: . . . Whereas our Amid-Thin W label says "naphthylacetamide," which is the amide of naphthylacetic acid, your article [Pesticides Report (*Nov. 3*)] says "N-1-naphthylacetamide," which, as correctly stated in the article, is the naphthylamide of acetic acid; but this is not a growth regulator and is not contained in our product.

Other errors: . . . A Cl atom is missing in position 2 in the formula for 2-(2, 4, 5-trichlorophenoxy) propionic acid on p. 84. . . . The only indole butyric acid used as a growth regulator is 4 and not 2 (3-indole) butyric acid (A.C.S. nomenclature). . . .

J. M. F. LEAPER
Consultant
Agricultural Chemicals Division
American Chemical Paint Co.
Ambler, Pa.

Chlorate Producers

TO THE EDITOR: The magnitude of the task of assembling data for the most interesting three-part *CW* report on pesticides by Carl D. Fischer is tremendous. We thoroughly understand your statement, "It is impossible to guarantee perfection."

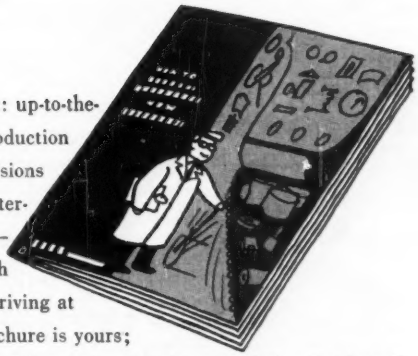
Perhaps it is well, however, to bring to your attention that in the tables of the third part (*Nov. 17*), on p. 92, under "Soil Sterilants," and on p. 94, under "Defoliants," the two largest manufacturers of sodium chlorate were omitted. These are Oldbury Division, Hooker Electrochemical Co. and Western Electrochemical Division of American Potash and Chemical Corp.

The Oldbury Division of Hooker produces the product in large volume at both Niagara Falls and Columbus,

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

HOW TO SNELL OUT (DEVELOP) SUCCESSFUL NEW PRODUCTS



Here's what you need to know to assure yourself of a *successful* new product: up-to-the-minute facts about competitive features, potential place in the market, production techniques and material costs. These are essential to your final decisions as to whether and when you develop a new product. How to determine these facts—how to "snell out" successful new products—is described in a brand new brochure, jam-packed with case histories, do's and don'ts, and techniques for arriving at the *right* decisions. A copy of this valuable brochure is yours; simply write on your letterhead and ask for "How to Develop Successful New Products." Address to: Foster D. Snell, Inc., Dept. K-1 , 29 West 15th St., New York 11, N. Y. No obligation.

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William Henry Perkin

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OPINION

Miss., and we believe is acknowledged to be the leading producer by a substantial margin. We believe that Western Electrochemical is the second largest. . . .

T. H. TRIMBLE
Manager of Public Relations
Hooker Electrochemical Co.
Niagara Falls, N. Y.

Polyamides Are Nontoxic

TO THE EDITOR: We have read your article "Vying for Solder's Jobs," (*Nov. 24*).

. . . You make the following statement: "The catalyst seems to be a major handicap of the epoxies now—most of them are *polyamide* hardeners that are hazardous when in prolonged contact with skin or when breathed for some time." . . .

We feel that this was a typographical error and that you did not mean polyamide, but instead polyamine. We have spent a great deal of time and money advertising the nontoxic properties of our Versamid polyamide resins. . . .

WILLIAM F. MITCHELL
General Mills, Inc.
Chemical Division
Kankakee, Ill.

Reader Mitchell is indeed right. It should have read "polyamine."—ED.

No Help That Cheap

TO THE EDITOR: . . . With respect to the article titled "How Cheap Is Titanium" (*Dec. 8, '56, p. 62*), I wonder where labor can be obtained for $1.07/hour. According to my interpretation of the figures given [in the table], this rate has been used in calculating the cost. I would appreciate clarification.

ARTHUR L. SMITH
Rohm & Haas Co.
Bristol, Pa.

Reader Smith detected an error in our story that even the Bureau of Mines, which checked it, failed to catch. During a mathematical lapse, an editor divided man-hours per pound into the hourly rate of $2.50 instead of multiplying the factors. The correct figure should be 37¢ per pound.

The Bureau of Mines people in Boulder City probably failed to catch the error because the 16¢ per pound

News from
National Carbon Company
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PROCESS EQUIPMENT BRIEFS

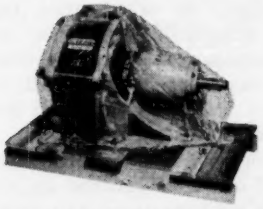
New heat exchanger sizes

A steady progression of unit capacities – in eight standard sizes having from 17.7 to 162.2 sq. ft. of heat transfer surface – is now available from stock in "Karbate" impervious graphite heat exchangers, "Series 90A" and "Series 310A". Units have interchangeable end assemblies with choice of 1, 2, 3, 4 or 5 pass arrangements.

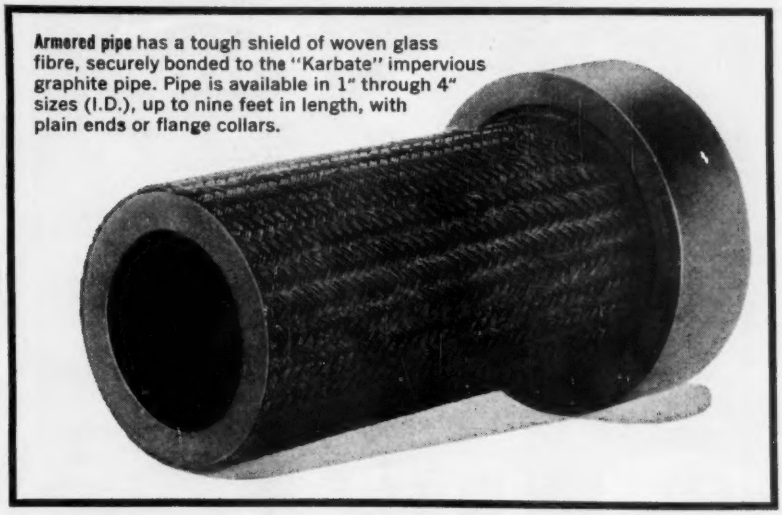
For details on these popular, low-cost corrosion-resistant units, request **Catalog Section No. S-6740.** Data on larger "Karbate" impervious graphite shell and tube heat exchangers (up to 3515 sq. ft.) are given by **Catalog Section No. S-6800.**

Carload shipment of "Karbate" pumps

Increasing use of "Karbate" impervious graphite for transfer and circulating services is demonstrated by shipment of a carload of "Karbate" centrifugal pumps for use in rayon spin bath service. Here, where 15% H_2SO_4 at 200°F. is handled, the use of "Karbate" pumps will eliminate possibility of metallic contamination.



Packaging of "Karbate" pumps is convenient, too. Covered with vinyl film, each pump is securely anchored on a pallet and crated. Complete instructions on installation and operation are sent with each pump. For further information, ask for **Catalog Section No. S-7250.**



Armored pipe has a tough shield of woven glass fibre, securely bonded to the "Karbate" impervious graphite pipe. Pipe is available in 1" through 4" sizes (I.D.), up to nine feet in length, with plain ends or flange collars.

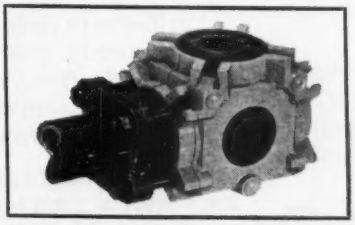
New "KARBATE" Armored Piping Gives Extra Safety with Corrosives

Greatly increased resistance to mechanical shock and strain is now a property of "Karbate" impervious graphite pipe and fittings. The reason: a newly-developed external armoring of tough, woven glass-fibre securely bonded to the pipe itself.

The most important result of this new idea in corrosion-resistant piping is the increased safety it provides in the handling of hot or corrosive liquids. In addition to increasing the resistance of "Karbate" pipe to accidental breakage, the closely-woven glass-fabric armoring remains intact even if the pipe should happen to be broken, holding line pressure . . . preventing potentially dangerous gross leakage.

Of course, this new line of "Karbate" armored pipe and fittings exhibits all the properties that have earned "Karbate" impervious graphite products wide acceptance in the chemical process industries: outstanding corrosion resistance . . . freedom from metallic contamination . . . resistance to thermal shock . . . ease of fabrication and installation.

For dimensions and other data on "Karbate" armored pipe and fittings, request **Catalog Section No S-7005.** Technical advice and assistance are also readily available.



Armored fittings have cast iron housing which not only armors the impervious graphite body but isolates it from any tensile or flexural stresses resulting from misalignment, vibration or expansion and contraction. Joint between pipe and flange collar has high strength because glass fibre sheath extends well into collar counterbore.

NATIONAL TRADE-MARK

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Adsorption a basic step in processing

Accumulated experience reveals that adsorption is a basic unit operation in chemical engineering technology. Its familiar applications include gas purification, air conditioning, solvent recovery and many other specialized uses.

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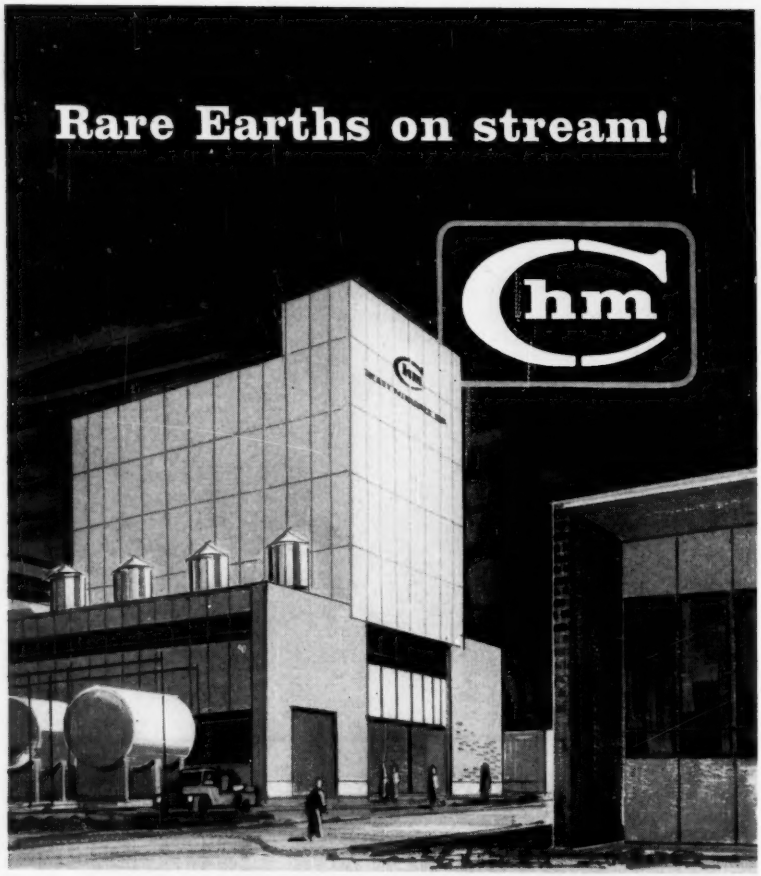

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figure that we published is the estimated labor cost for the ultimate commercial process.—ED.

Distributors' Mandate

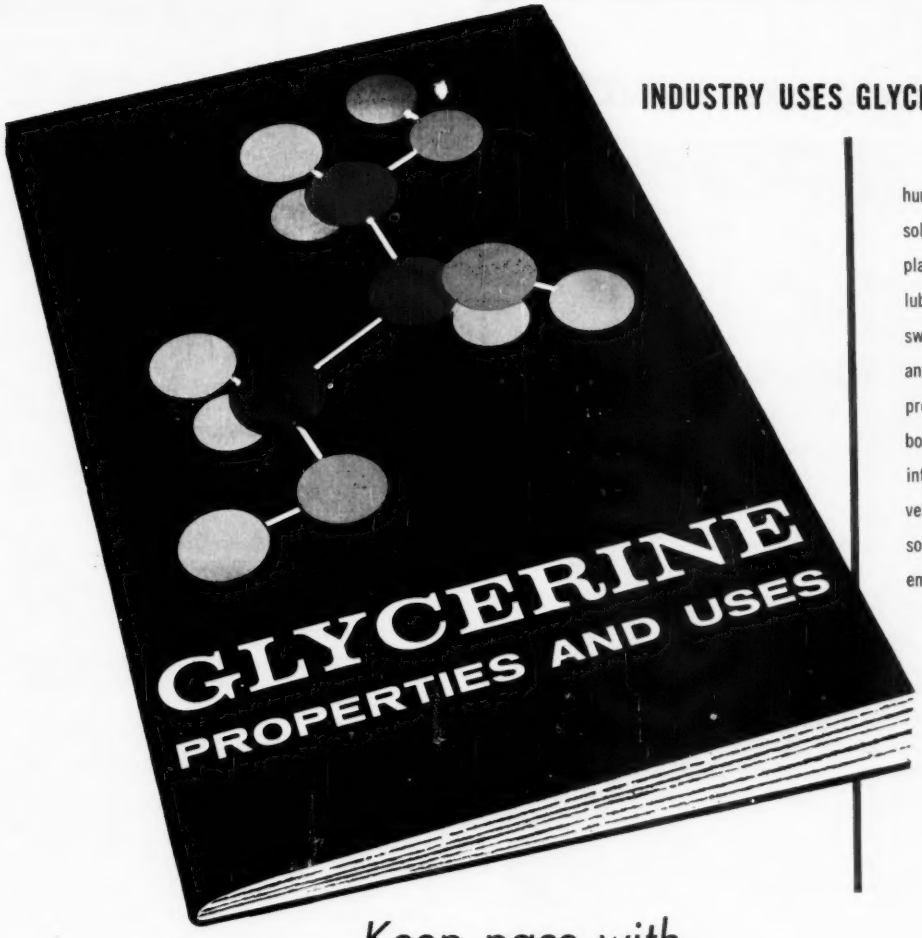
TO THE EDITOR: Reference is made to your article on mixed truckloads (*Dec. 8*).

There is, of course, little question that the growing practice of shipping mixed carloads, especially of detergent raw materials, hurts some distributors, particularly the less aggressive firms. It may also be that the prime manufacturers are not in favor of it, as you state, although I am inclined to pass that off as so much "lip service" to the distributing trade. But mixed carload and mixed truckload shipments are not the short-sighted gimmick of a few unscrupulous sales managers; they are actually an economic necessity for the small converter, and become more so every time freight rates go up.

You mention in passing a freight saving of about $1.50 over LCL rates for a converter here in Atlanta (on phosphates and alkyl aryl sulfonates). On a single truckload of, say, 26,000 lbs., that saving alone amounts to almost $400; and to many a smaller converter, that figure is the difference between staying competitive and folding up. That the direct factory-to-consumer route also results in generally lower distribution costs because of less handling, no warehousing expense, etc., is further reflected in the fact that factory prices are usually lower for TL shipments than for LCL orders, which amounts to an extra bonus—often badly needed.

Nor is this the end of the story. A small converter who can use a mixed truck every month would have to buy, finance and stock 3-4 months' [supply of] raw materials if he had to buy in solid trucks. He can very quickly figure how much more this would cost him in square feet, in capital, in interest. Let me assure you if the prime manufacturers would not offer him this service, he would demand it until he would get it, and rightly so.

Where does this leave the distributors? It leaves them with the clear-cut mandate to concentrate on those phases of their business for which there will always be a need, and always at justified premium price: LCL and spot deliveries, brokerage arrangements, and, most of all, reliability and



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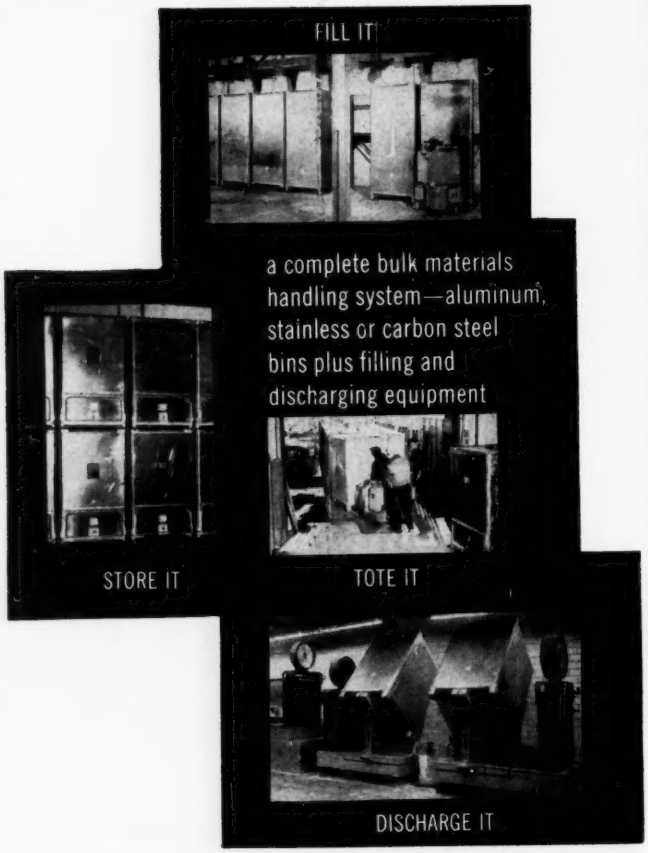
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MEETINGS

Society of Plastics Engineers, 13th annual technical conference, Sheraton-Jefferson Hotel, St. Louis, Jan. 16-18.

Engineers Joint Council General Assembly, Hotel Statler, New York, Jan. 17-18.

Stanford Research Institute, industrial economics conference. Theme: Implementing long-range company planning. Fairmont Hotel, San Francisco, Jan. 21-22.

Assn. for Applied Solar Energy, solar furnace symposium, Hotel Westward Ho, Phoenix, Ariz., Jan. 20-22.

Compressed Gas Assn., Inc., 44th annual meeting, Waldorf-Astoria, New York, Jan. 21-23.

Assn. of American Soap and Glycerine Producers, annual convention, Waldorf-Astoria Hotel, New York, Jan. 23-25.

Texas A&M College, 12th annual symposium on instrumentation for the process industries, College Station, Tex., Jan. 23-25.

Chemical Buyers' Group—National Assn. of Purchasing Agents, midwinter meetings, Western division, Congress Hotel, Chicago, Jan. 24; Eastern meeting, Hotel Commodore, New York, Jan. 29.

Industrial Security Institute, and Kanawha Valley Industrial Emergency Planning Council, first seminar on industrial mutual aid organization, Charleston, W. Va., Jan. 30-31.

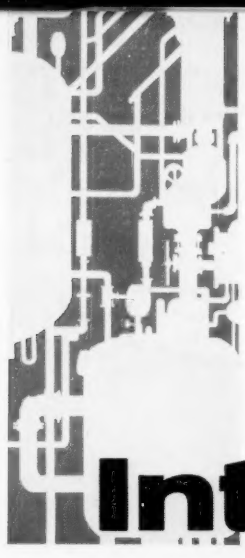
American Society for Testing Materials, annual meeting, Benjamin Franklin Hotel, Philadelphia, Feb. 4-8.

American Pharmaceutical Manufacturers' Assn., Central section meeting, Edgewater Beach Hotel, Chicago, Feb. 11-13; Western section meeting, Ambassador Hotel, Los Angeles, Feb. 18-19.

Technical Assn. of the Pulp and Paper Industry, 42nd annual meeting, Hotel Commodore, New York, Feb. 18-21.

American Institute of Mining, Metallurgical and Petroleum Engineers, Inc., annual meeting, Hotel Roosevelt and Jung, New Orleans, Feb. 24-28.

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Penn-Sheraton Hotel, Pittsburgh, Pa., March 4-8.



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ETHYL PHENYLACETATE
beta IONONE
ISOVALERIC ACID
LAUROYL CHLORIDE
p-METHOXY PHENYLACETIC ACID
METHYL HEPTENONE
METHYL PHENYLACETATE
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PHENYLACETIC ACID
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PROPIONYL CHLORIDE
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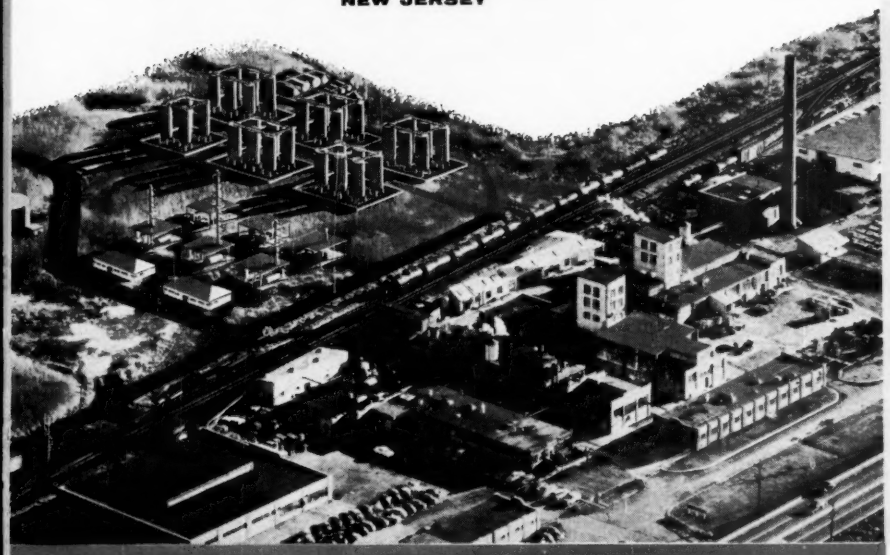

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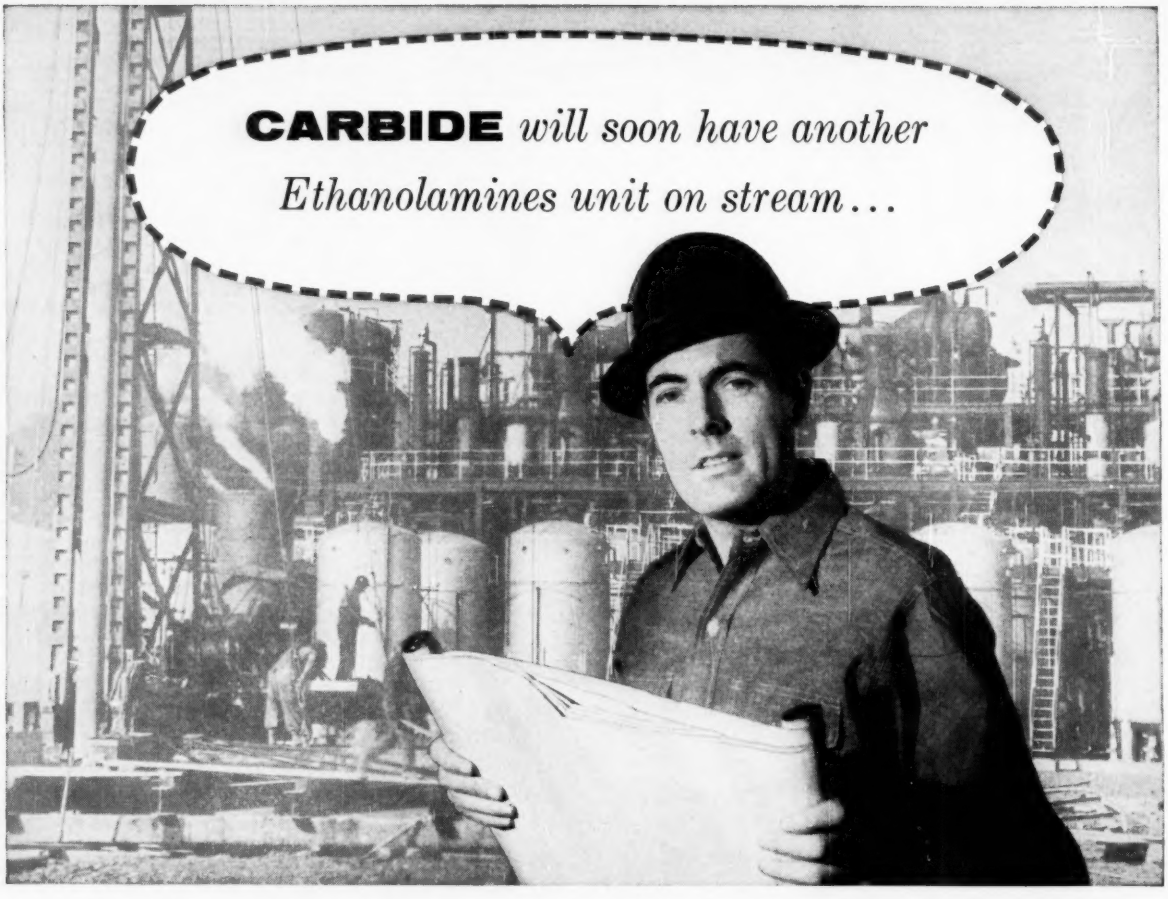

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Business
Newsletter

CHEMICAL WEEK
January 12, 1957

The long-delayed announcement of public sale of the government stock holdings in General Aniline & Film Corp. seemed only hours away as *CW* went to press. The announcement—which would be revealed by the filing of a registration statement with the Securities and Exchange Commission by Attorney General Herbert Brownell—awaited only completion of minor details connected with the complicated transaction.

It is expected the registration will cover about 80% of the GAF stock held by the government—a percentage which officials in Washington maintain is unaffected by any pending litigation seeking return of the seized assets. But the Justice Dept. move is certain to touch off another round of legal challenges by the Swiss holding company, Interhandel, and by other interested parties.

Such complications could upset predictions by government experts that sale of the stock could be completed about two months after filing of the registration statement with SEC.

•

Chemical companies in the Buffalo-Niagara Falls area which use 25-cycle power got another jolt last week. Niagara Mohawk Power Corp. proposed 2%-10% boosts in rates on the 25-cycle power, claiming the "readjustment" is necessary because of the loss of 25-cycle generating capacity of the Schoelkopf hydroelectric station, which tumbled into the Niagara river last summer.

The proposed rate boost is an obvious move to force installation by industry in the area of equipment using 60-cycle power—a move fought by much of the established industry there, including a dozen major electrochemical processors. Ever since the collapse of the Schoelkopf generating plant, Niagara-Mohawk has urged its replacement with a 60-cycle plant as part of a general changeover to higher-cycle current. This has been resisted by a segment of local industry, since it would require prohibitive expenses for new equipment.

The rate increase, estimated to bring some $7 million/year additional to Niagara-Mohawk, must be approved by the New York Public Service Commission. Industries favoring the 25-cycle current have asked the Federal Power Commission to intervene in hearings.

•

More Mexican sulfur's in sight. Central Minera, S.A., the Mexican subsidiary of Texas International Sulphur Co. (Houston), will build a $3.5-million, 1,000-ton/day Frasch-type sulfur plant on its holdings on the Isthmus of Tehuantepec.

A subsidiary of Fish Service Corp. (Houston), Fish Service de Mexico, S. A., will erect the plant, which is scheduled onstream in March, 1958.

Land for expansion has been acquired by Stauffer and Du Pont. Stauffer purchased a 33.1-acre site near Ashtabula, O., for the construction of its titanium tetrachloride plant (*CW Technology Newsletter, Nov. 10, '56*). The plant, with estimated minimum capacity of 20-21,000 tons/year, will supply the tetrachloride for National Distillers Products Corp.'s titanium sponge producing works, and perhaps others, too.

Du Pont added about 52 acres of land near Maysville, Ky., to its list of properties; although the land is for a new plant, Du Pont hasn't yet said what it expects to manufacture there, or when it hopes to begin building. It has been acquiring properties near Maysville for over a year.

•

Canadian chemical processors are already feeling the squeeze of the Canadian Pacific Railway strike. At Windsor, Nova Scotia, Canadian Gypsum Co. (subsidiary of U. S. Gypsum Co.) laid off 400 workers; in the Sudbury, Ontario, region, International Nickel Co. cut back its work force by over 650; in New Brunswick, St. George Pulp & Paper Co. furloughed 150.

Canadian Labor Congress officials are aiding efforts for strike settlement. But the Brotherhood of Locomotive Firemen and Enginemen has not backed down from its stand against the railway's proposal to reduce the number of firemen on its diesel locomotives—key point of the controversy, which culminated in a strike last Wednesday.

•

Considerably more encouraging Canadian news is the word that a $20-million potash refinery will be built in Saskatchewan by Potash Co. of America's Canadian subsidiary. It will be the first plant of this type in Canada, producing 1.5 million tons/year. The company has a site on Patience Lake about 10 miles east of Saskatoon, in the central part of Saskatchewan.

Stearns-Rogers Mfg. Co. (Denver) will engineer the new mill, construction of which will be started in mid-'57 for October, '58 completion. Potash Co. already has a 900 foot shaft sunk toward the potash beds which lie at about 3,400 ft. below the surface.

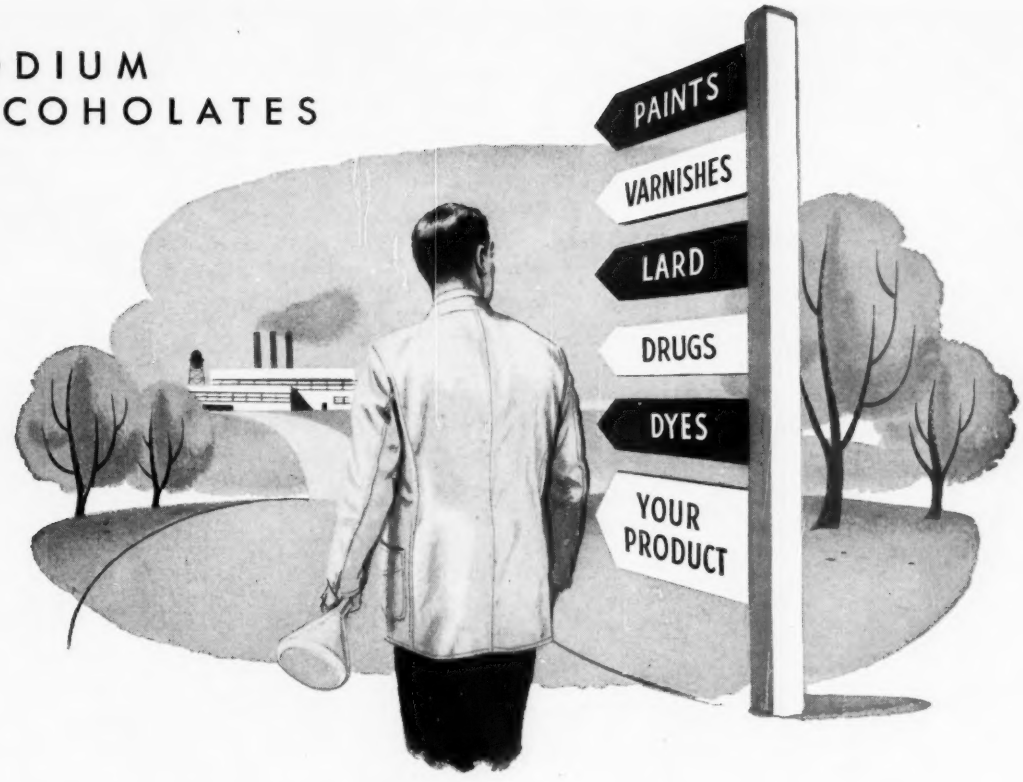
•

Velsicol Chemical Corp. (Chicago) will supply methyl parathion to cotton growers for the coming season. Velsicol, best known for its chlorinated insecticides (chlordane, endrin, heptachlor), will make phosphate insecticides at its Marshall, Ill., plant. The firm has several other phosphate insecticides under development, a spokesman told *CW*.

•

A chemical man takes over a high political post this week in a state legislature (*see also p. 21-22*), as James Totman, vice president of Northern Chemical Industries, assumes the duties of majority leader of Maine's House of Representatives. As a legislator, Totman has been particularly active in highway safety programs.

SODIUM ALCOHOLATES



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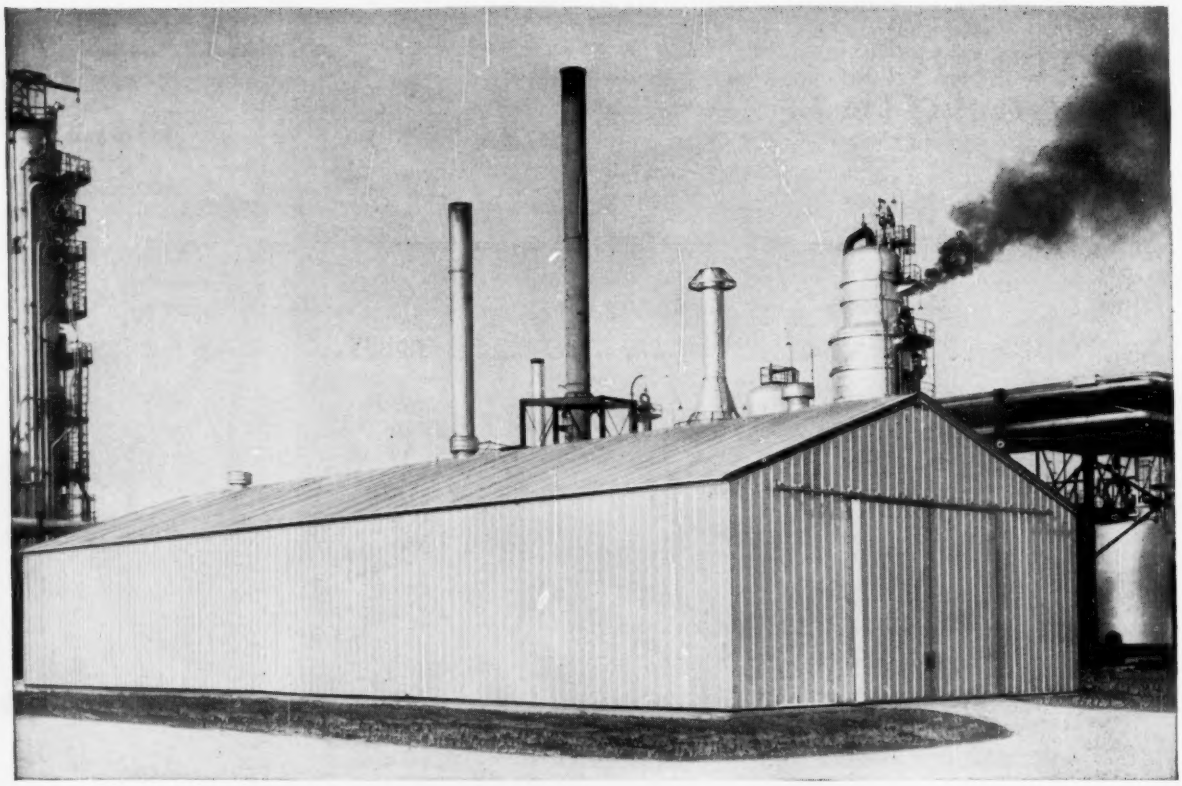

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Chemical Week

January 12, 1957

State Groups Ponder New Laws

While chemical process management last week was rolling up its sleeves for the year ahead, state legislators were gathering at their respective capitals to initiate programs that could have marked effect on chemical business.

The Outlook: Lawmakers convene in 45 states* in 1957. And as a *CW* survey shows, chemical management can expect important action in three broad areas of legislative effort:

- Heavier taxes, as state and local governments seek additional revenue.
- More definitive laws dealing with water—involving pollution control, development and conservation.
- Increased concentration on state labor legislation. Laws involving "right-to-work," labor relations, and union welfare funds are up in many states.

Taxes: Though more than half the states have been conducting studies to achieve a more equitable distribution of tax burdens, many have made tax studies with an eye toward finding places to dig up additional revenue. Sources most likely to be heavily used for more revenue are corporate and personal incomes, and general and specific sales.

Water: Many states will be considering proposals for basic changes in state policy governing the use of water resources. Also high on the list of things to be studied are measures to curb pollution and proposals to facilitate the financing of municipal sewage treatment plants, either through liberalized local borrowing requirements or through some form of direct state aid. Port development projects, too, will be pushed—especially those along the St. Lawrence Seaway.

Labor: Widespread attention will be given this year to laws regulating so-called "open shop" and "closed shop" work agreements. "Right-to-work" laws are currently effective in 17 states,† but Louisiana's repeal of its law in 1956 is deemed by many to be the harbinger of violent battles in a number of other states. And fights are expected in states such as Maryland, where such a law is only proposed.

Other proposals will be directed toward providing new labor relations acts and to regulate union welfare funds.

*Exceptions: Kentucky, Mississippi, and Virginia.

†Alabama, Arizona, Arkansas, Florida, Georgia, Iowa, Mississippi, Nebraska, Nevada, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia.

Key Chemical States: In addition to general legislative aims outlined (*p. 21*), a number of states that are important chemical centers have statutory projects docketed which may well set patterns for others.

California—An $11.3 billion plan and enabling legislation are proposed to carry water development and control measures from the study stage into the actual construction stage. Top goal: further development of the Feather River to bring water from northern California to the southern part of the state.

Illinois—Faced with a budget deficit in 1957 of $300 million, Illinois solons seek new sources of additional income. Upcoming court tests may force new legislation to integrate supplemental unemployment benefit plans with state unemployment compensation.

Michigan—Legislators will probably hear the relative merits of two plans for tapping Lake Huron to bring some 500 million gal./day of water to eastern Michigan.

New Jersey—Proposals to set up a "much needed" labor relations act are on the docket, as are sweeping changes in tax laws to provide standard and equalized property valuation assessment for tax purposes.

New York—Changes in labor laws to prevent employers denying jobs solely on the basis of age will be considered along with proposals to make healthy liberalizations in state workmen's compensation laws.

Ohio—Legislators may schedule hearings and enact a code governing use of natural water resources. Action on proposals to allow the state to seize and operate such strike-bound utilities as power companies will provide a hot battle.

Pennsylvania—A study committee will recommend broadening of the present sales tax and imposition of several new ones. Plans for rehabilitation of injured workers will be studied.

Texas—In spite of a state budget surplus, legislators are looking for new revenue sources; in addition, they will be asked to provide $10 million/year for water storage facilities at dams that will be built by the Federal government.

West Virginia—Congressmen will act on a bill to establish a state agency to aid small communities in efforts to bring industry to the state. A development credit corporation would distribute funds to local agencies.

Results of Senate Stock Study

- **Institutional investors' impact on the stock market was "much greater on the demand than on the supply side of common stock transactions. To that extent they contributed to the rise of stock prices."**
- **"Not only did institutions trade in a limited number of issues, but these issues tended to be in the forefront of market activity and of the upward swing in prices."**
- **Division of opinion "among the institutional groups may have contributed to Union Carbide manifesting a relatively mild rise in price."**
- **"The institutional investor showed little interest in acquiring Du Pont during most of the stock-market rise."**

New View on Stock Prices

Common stocks of chemical process firms are among those deemed to be "significantly affected" by the stock-buying habits of institutional investors.

This point, and many others, are made in a just-published Senate Banking Committee report on "Institutional Investors and the Stock Market." And process industry men, turning more toward equity financing (*CW, Sept. 1, p. 30*), are wondering whether their stocks are inflated from volume buying by institutions. Already, Wall St. banking houses are beginning to shy from over-valued chemical stocks that are failing to show the earnings they turned in during the great 1953-55 bull-market (*CW, Dec. 8, p. 21*).

The Key Twenty-five: The committee staff concerned themselves with the stock purchases of some 210 "institutional" investors such as mutual funds, corporate pension funds, insurance companies, and bank-managed trust funds. They also selected for study some 25 stocks, concentrated on their movement from Jan. '53 to Oct. '55 and compared their movement to that of the stock market as a whole.

Their conclusion: The institutional investors played a "significant" part in promoting the stock market boom of the period. Moreover, because they concentrated on a relatively small group of stocks, they tended to accelerate the rise.

Chemical Quartet: How did chemical process company stocks fare during the period studied? The report's lengthy analysis of four companies, Du Pont, Union Carbide, Standard Oil of California and Standard Oil of New Jersey, provides no single answer.

In the case of Du Pont, the researchers found that all the groups, with the exception of corporate pension investors, "appeared to find the soaring price of Du Pont in 1954 and 1955 as ground for sharply curtailed activity"—*i.e.*, they cut their buying.

In contrast, the report finds, institutional trading in Union Carbide continued at quite a stable level over the 34 months covered in the study. It points out that one possible influence making for greater continuity was that the price of Carbide moved up at a rate only half that of Du Pont. Since there was considerable division of opinion among the investors over the value of the stock, the report concludes that such differences may have "had some restraining influence on the rise of price."

Tin, and Tungsten Too

The long-awaited sale of the government's Texas City tin smelter was arranged last week. Wah Chang Corp., one of the largest tungsten smelters in the U.S., agreed to buy the 15-year-old plant for a base price of $1.35 million.

The company hopes to make the Texas City tin smelting operation —long a money-losing proposition— a profitable one by partially converting the plant to manufacture of tungsten metal.

The acquisition will cost Wah Chang $135,000 initially; the rest of the price is to be paid off in ten equal yearly installments, plus 4% interest. Under terms of the sale the government will share in the plant's profits, and under this arrangement the company may have to put up as much as an additional $2 million, depending upon how successfully it's able to run the plant.

The government's original investment in the smelter amounted to $13 million. However, after deducting depreciation allowances, the smelter is now carried on the books at about $5 million. Through its profit-sharing plan with Wah Chang, the government hopes to recoup most of this present book value.

The plant, only one of its kind in the U.S. and the only tin smelter of any size in the Western Hemisphere, was started up in 1941 by the U.S. government to offset this country's dependence on Malaya for tin imports. It's been a money-loser ever since.

A Wah Chang spokesman said the plant "operated as a tin smelter exclusively was an economic failure before, and probably would be again." Therefore, the company, while it will still turn out tin—in greatly reduced amounts—will concentrate on manufacturing tungsten.

Another company official indicated that even though much conversion was necessary, Wah Chang could probably have the plant on-line before the end of '57. Several company engineers are now studying equipment and construction needs.

Wah Chang won't officially take over until February 1, when the present government operator, Tin Processing Corp., a subsidiary of the Dutch-owned N. V. Billiton Co., is scheduled to close it down. The smelter, according to present plans, won't reopen until all new equipment is installed.

Wah Chang is already well known for its mining and refining of tungsten. Incorporated in New York state in 1916, the company makes tungsten powder, wire and rods for the automobile, electronics and die-making industries. It also is in the zirconium business, having recently acquired a plant in Albany, Ore. *(CW, Sept. 8, '56, p. 43).*

Florida Gets its Gas

Florida will get its natural gas pipeline. The long awaited, much disputed Texas-to-Florida project has been conditionally approved by the Federal Power Commission.

The most important of such conditions requires Houston Texas Gas & Oil Corp. and Coastal Transmission Corp., joint builders of the line, to submit financing plans and new rate scales to the commission for approval.

The new rates will mean higher-priced gas to two Florida power companies (Florida Power & Light Co. and Florida Power Corp.) who are committed to use 60% of the 250-million-cu.-ft./day supply. It doesn't necessarily mean higher rates for the nine chemical processing plants that seem likely to be seeking a portion of the remaining 100 million c.f.d. the line will transport.

As things stand now, the gas will be sold with a price established on a Btu basis rather than by volume (*CW, Dec. 1, '56, p. 21*). Chemical companies with Florida interests are still hoping this will be changed to allow economic use of the gas as a raw material supply source rather than as as a fuel.

The companies' proposal, now cleared by FPC, calls for Coastal to build a line from Texas to the Mississippi River at a cost of about $55 million. At the Mississippi, this pipeline will connect with one to be built by Houtex, which will carry the gas all the way to a point south of Miami, Fla. Houtex will spend about $94 million completing its part of the project, which is scheduled to be supplying gas by mid-'58.

Chief Banker

New chairman of the Federal Reserve Bank of New York for 1957 is John E. Bierwirth, 61-year-old president of National Distillers Products Corp. The board of Governors of the Federal Reserve System confirmed his appointment last week as the term of former chairman Jay E. Crane ended.

Brooklyn-born Bierwirth, a director of the New York bank since 1953, takes on a job of broad significance to chemical process industry executives—as to management in general. As chairman of the New York "Fed," most important of the 12 reserve banks, his views, expressed in banking policy, on "loose" or "tight" money and on corporate credit are bound to affect expansion and capital spending programs scheduled to materialize in '57.

Bierwirth looks kindly on current credit policies: "I think just about everyone has gone along with it so far. There have been some objections . . . but most people feel it's a good thing. Some pretty ambitious expansion programs were mapped out last year—too ambitious in many cases. And something like [tight money] was needed to keep them at a realistic level."

Bierwirth figures that '57 may see some loosening of nation's purse strings. "Of course," he adds "we'll try to make the credit policy fit business conditions."

Washington Angles »

» **Chemical makers who plan up-to-$5 million** expansions at a single location may obtain some sort of government tax help after all, even if applications for such tax write-offs had previously been turned down.

That's the hope which was offered by the Office of Defense Mobilization last week in interpreting an earlier directive. Affected are applications for write-offs on plants costing $5 million or less that had been turned down because the proposed plant locations were too close to prime wartime bomb targets.

ODM said it would reconsider such applications, even if the expansion goal for the product covered had later been filled and the goal closed.

In a case that involved an unspecified petrochemical facility, however, ODM closed one possible "loophole" in its directive. It said it won't let a firm get write-offs by filing separately on two or more projects at the same location—if the combined total exceeds $5 million. The rule applies, says ODM, even though (as in this case) the company had originally filed separate applications—applications that ODM itself then lumped together.

In this case, ODM refused to allow the company to reapply for even one of the two projects involved—although each of the separate applications was for an amount less than $5 million.

» **New appointments to two posts** in the Health, Education and Welfare Dept. will come up for Senate confirmation soon—and both appointees will have a voice in Administration policies that affect chemical makers. Elliott Lee Richardson, a Boston lawyer, was named Asst. HEW Secy. to handle legislation—including such matters in HEW's jurisdiction as the chemical food additives bill.

And, HEW Secy. Marion Folsom chose Dr. Aims C. McGuinness of Philadelphia as a special assistant to advise him on medical affairs. He'll work on health insurance proposals—keep tabs on various medical programs.

» **A nationwide search for foods** canned before 1945 has been started by the canning industry. The effort is part of a new program launched by the Food and Drug Administration to learn what, if any, changes in radioactivity in the nation's food supply can be traced to weapons-testing and other uses of atomic energy.

FDA wants to test the naturally occurring "background radiation" of the pre-1945 packs to obtain a base for future radiation measurements.

Next step: the continuous monitoring of newly packed foods from various sections of the country.

EXPANSION

Sodium Chlorate: Hooker Electrochemical Co. is now blueprinting a $1-million expansion of its Columbus, Miss., sodium chlorate plant. Proposed installations would boost the plant's annual output from 17,000 to 22,000 tons.

•

Chlorine/Caustic: Allied's Solvay Division plant in Brunswick, Ga., will be doubled in capacity this year at a cost of about $10 million.

•

Ammonia: Quebec Ammonia Co., Ltd., will build a $9-million ammonia plant near Brockville, Ont.

•

Polyethylene: Carbide Chemicals Co., a division of Union Carbide Canada, Ltd., will double the polyethylene and ethylene glycol capacities originally planned for its Montreal East plant. The Canadian unit, abuilding since early '55, is scheduled to be onstream by this spring.

• Visking, Ltd., whose U.S. parent is now a wholly owned Union Carbide subsidiary (*CW Business Newsletter, Dec. 29, '56*) will build a $500,000 polyethylene film-making plant at Fort Gary, Winnipeg, Man.

COMPANIES

Anaconda Co. directors have approved a new issue of stock to be offered to present stockholders. Anaconda will use proceeds from the sale, terms of which haven't yet been revealed, to help finance its $100-million spending program for '57.

•

Riegel Paper Corp. stockholders have okayed a plan to acquire Norman Lumber Co. (Norman, N.C.). The proposal calls for an exchange of 109,467 Riegel common shares for all the 1,880 outstanding shares of Norman.

•

Allied Laboratories Inc. (Kansas City) has purchased all the outstanding stock of E. B. Shuttleworth, Ltd., Canadian pharmaceutical firm. Terms were not disclosed.

•

The merger of Heyden Chemical Corp. and Newport Industries became official last week after stockholders of both companies had approved the move. Terms call for one and one-half shares of Heyden to be exchanged for each share of Newport common stock. Name of the new company: Heyden Newport Chemical Corp.

FOREIGN

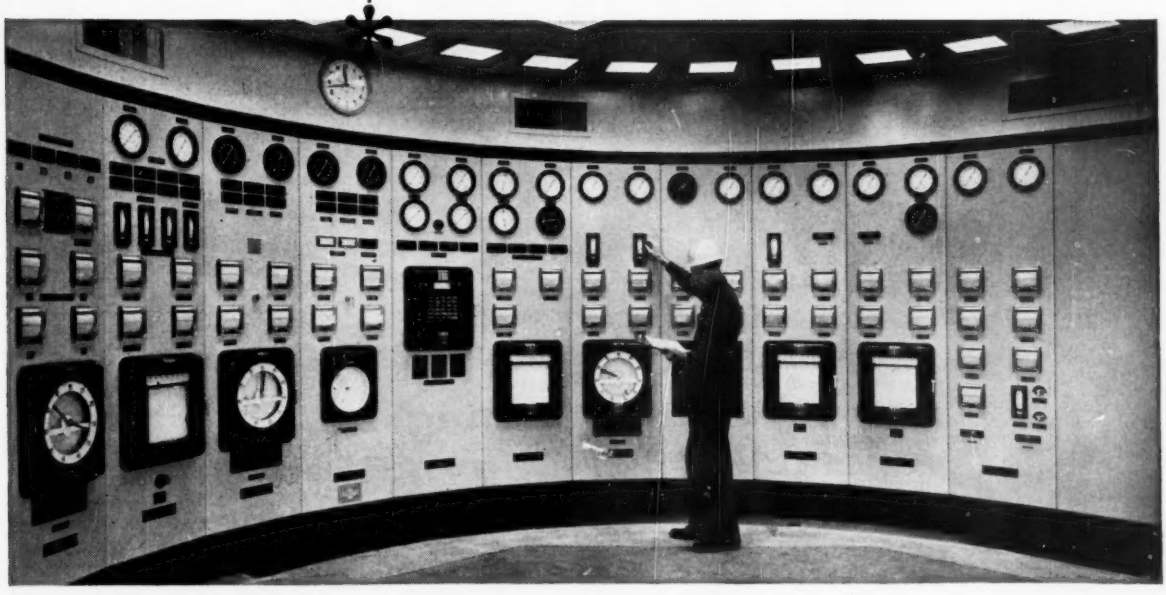
Glass/India: The Indian government has broken off negotiations with the Japanese firm K. K. Kogaku for a $3.6-million optical glass plant slated to be built near Calcutta. Instead, New Delhi officials are studying an offer from the Soviet government for financing the state-owned plant. Reason for the switch: the Japanese firm's inability to provide long-term credit.

•

Potash/Italy: Rome has now officially confirmed the existence of new potash beds in Sicily. Latest find to be reported is a 25-million-ton bed of kainite at Boasco, near Serra di Falco. Earlier, beds of scheelite and carnallite were discovered in Villapriolo and Salinella.

This 19th century method of sorting fruit was a crude attempt at quality control. Today modern scientific instruments provide uniform quality of products from lot-to-lot. (Print from Bettman Archive)

QUALITY CONTROL HAS COME OF AGE



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And Hercules' distribution methods have kept pace with the times. Prompt shipment in tank cars, tank trucks, or drums is available. We'll be glad to discuss how tank truck deliveries in molten form can save you money.

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Sensitive to air and moisture

Packs 4.2 pounds per gallon

Formula Weight 54.03

CHEMICAL ANALYSIS

Sodium Methylate . . . 97.5%
Sodium Hydroxide. . . 0.5
Sodium Carbonate. . . 1.2
Sodium Formate. . . . 0.3
Methanol (Free). . . . 0.5
Soluble in Alcohols, Fats, and Esters
Decomposed violently by water
Standard 95.0% min.

PHYSICAL PROPERTIES

Fine white powder—over 75% through 150 mesh—less than 1% on 10 mesh

Bulking Density . . . about 4 lbs. per gallon

Melting Point: none . . . decomposes in air above 260°F

Also Available

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Packaged in Steel Drums 425 pounds net

25% solution of sodium methylate in methanol

Analysis: Sodium Methylate Content . . . 25% minimum

Physical Properties: slightly cloudy to clear solution
Bulking Density . . . about 7 lbs. per gallon
Initial Boiling Point . . . 188°F for 25%
Flash Point (Cleveland Open Cup) . . . 85-90°F
Flash Point (Closed Cup) . . . 80°F
Crystallization Temperature . . . 30°F after equilibrium

STABILITY

Harshaw sodium methylate, both in powder and solution form, is stable in the sealed containers. Exposure to air will cause progressive decomposition—rapidly for the powder, more slowly for the solution.

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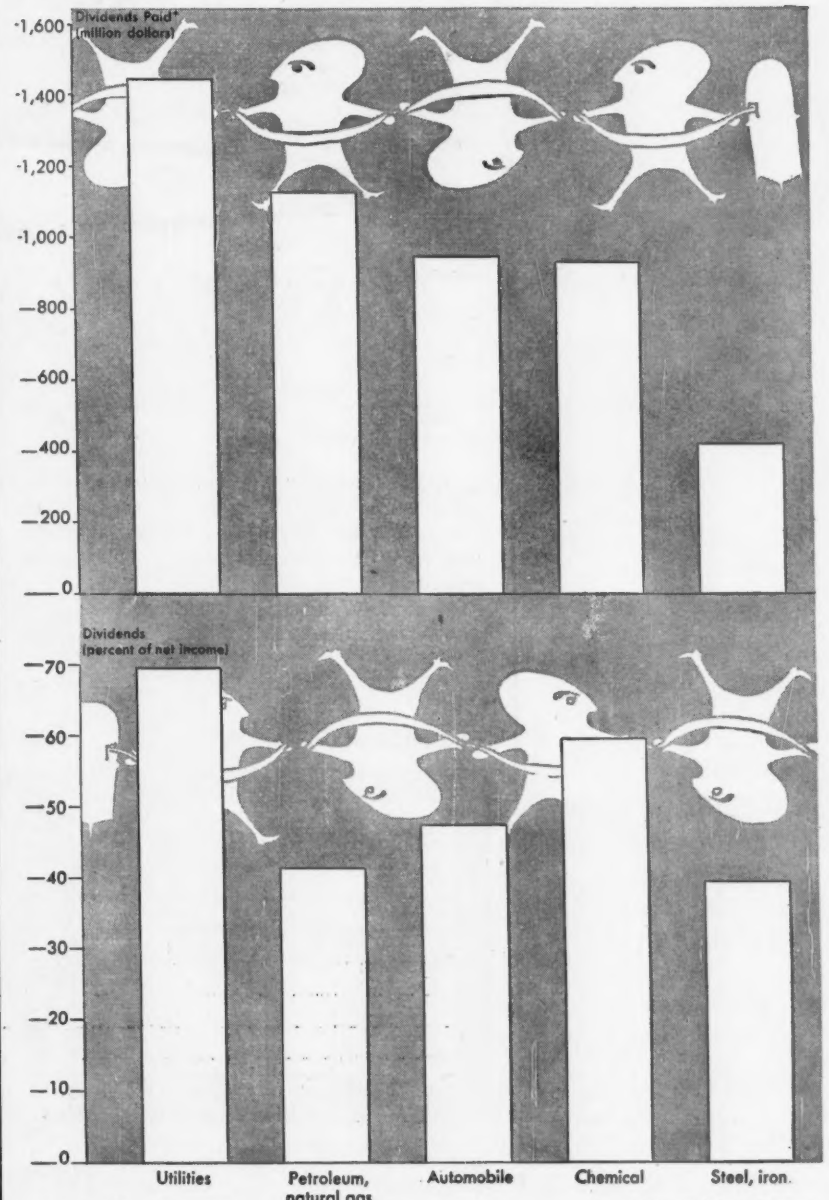
Charting Business

CHEMICAL WEEK
January 12, 1957

Dividends from chemical stocks are high:

total amount paid is fourth largest among U. S. industries



*Common and preferred stock.

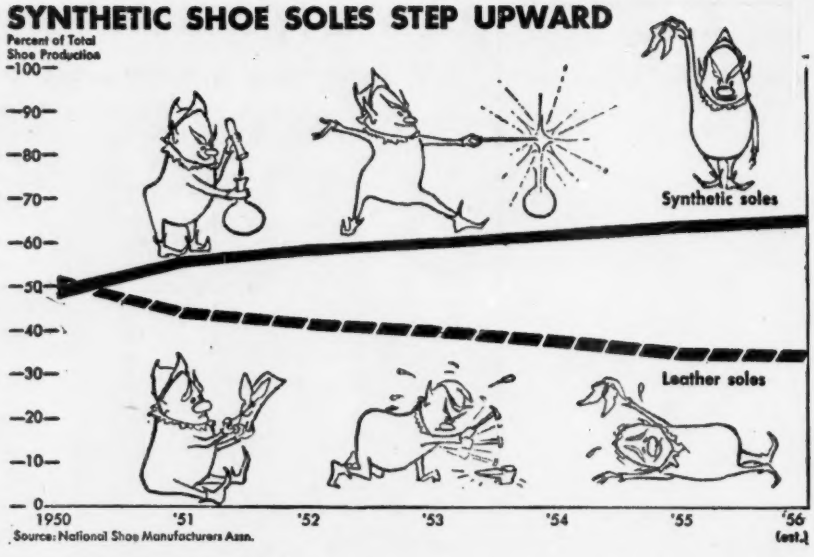
Source: New York Stock Exchange.

TODAY, 1,071 companies representing 27 industries have stock listed on the New York Exchange. These companies paid $8.2 billion in dividends during '56—an all-time high. Chemical industry paid $937 million, was fourth in the line-up of securities paying the highest dividends. Top three: utilities, petroleum and natural gas, automobile stocks; in fifth place, steel and iron. The chemical industry forged ahead to second place in percent of net income paid as dividends (59.3%), was surpassed only by utilities (69.3%).

Charting Business

(Continued)

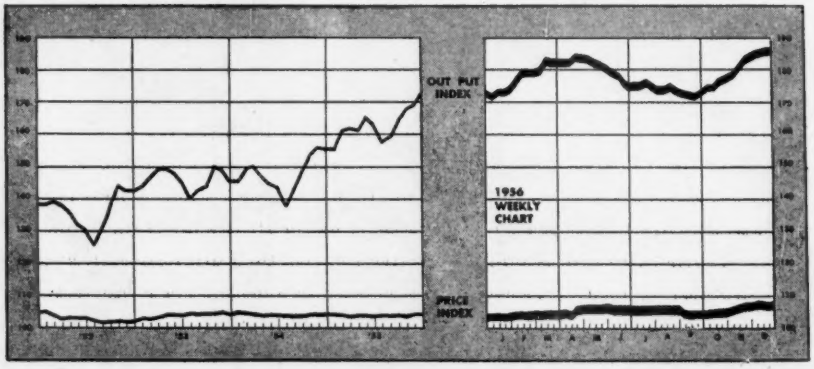
SYNTHETIC SHOE SOLES STEP UPWARD



Source: National Shoe Manufacturers Assn.

SHOE output over the last decade has remained, more or less, on an even keel—500 million pairs/year. But materials used in shoe manufacture have undergone radical changes. Example: in '46, only 20% of all shoes were made with synthetic soles; today, the figure is more than 65%. Aside from butadiene-styrene copolymers, chemicals used to make synthetic soles include zinc oxide, hydrated calcium silicate, benzothiazole disulfide, stearic acid, etc. The switch to synthetics, however, is leveling off.

BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	183.0	183.0	173.5
Chemical Week Wholesale Price Index (1947=100)	106.9	106.9	104.9
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	435.0	443.9	480.7

MONTHLY

Foreign Trade (million dollars)	EXPORTS Latest Month	EXPORTS Preceding Month	EXPORTS Year Ago	IMPORTS Latest Month	IMPORTS Preceding Month	IMPORTS Year Ago
Chemicals, total	99.8	108.6	97.7	22.1	18.7	20.7
Coal-tar products	6.1	7.8	6.5	4.4	3.8	4.4
Industrial chemicals	14.6	19.1	15.5	7.6	6.3	7.3

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New Industrial Insurance Plan Brings Simplification Savings

PROPERTY COVERED:

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- **Improvements and alterations**
- **Equipment and machinery**
- **Finished stock wherever located**

RISKS COVERED:

- **Fire and lightning**
- **Windstorm and hail**
- **Certain explosions**
- **Falling objects**
- **Riots and civil commotion**
- **Sprinkler leakage**
- **Vandalism**
- **Burglary**

SAVINGS POSSIBLE:

- **Up to 15% of premium, depending on amount of "premium subject to credit."**
- **Up to 28% of premium, depending on number of locations and proportion of total value concentrated at any one location.**

Insurance Will Cost Less

A new industrial insurance policy plan that could help most large and medium-size chemical companies to streamline insurance operations and save up to 43% on certain premiums is now being considered by state insurance officials throughout the nation.

The plan—known as the Industrial Property Policy Program—was drawn up after an intensive 18-month study by the Interbureau Insurance Advisory Group (New York), which is sponsored by some 150 capital-stock insurance companies. The plan has already been endorsed by two country-wide insurance industry groups; full approval by states is expected soon.

When these policies become generally available—possibly within a matter of months — a multilocation chemical company will be able to buy a single policy covering virtually all property loss risks at each of its locations. Equivalent coverage now requires at least three policies at each location. And except through purchase of three- or five-year term insurance, no substantial discount credits can be obtained on purchasing such individual policies for each of many locations.

Double Discount System: Under the proposed plan, normal premiums—roughly corresponding to present cost of equivalent coverage—would be scaled down by two credit factors. The first credit would depend on size of the premium and would range up to 15% of that portion of the gross premium in excess of $1,000. The second credit would be based on the number and relative size of the industrial facilities covered by any one policy. This second credit factor ranges from 2% on a policy covering 5 to 10 locations (with 51% or more of total property value concentrated at one of the sites) up to a maximum of 28% on 36 or more locations with no more than 20% of total value at any one facility. Both credits are conditioned on fire losses being kept below a certain level. Total credit for insurance on buildings and machinery would be limited to 15%.

First part of the new type of policy would be an industrial property form made out on either a reporting full-insurance-to-value basis, or on a nonreporting coinsurance basis. This would cover machinery and similar property, buildings and fixtures, insuring against damages from fire and lightning, windstorm and hail, riot and civil commotion, aircraft and vehicles, falling objects, smoke, vandalism, weight of snow and ice, sprinkler leakage and burglary. If the reporting form is used, the manufacturer would give the insurance company semi-annual reports on value of stock, machinery, other personal property, buildings and improvements at each location; and monthly reports on total value at all locations.

In addition, a processor or manufacturer would be able to buy a Special Personal Property Endorsement providing "all risk" coverage on:

- Finished stock wherever located. This would include chemical materials in transit or in storage.
- Other personal property, such as raw materials.
- Manufacturer's "use interest" in improvements and betterments on property owned by other concerns.

What does the plan mean to chemical process firms? Just this: however a firm now meets its insurance needs —through use of its own reserves, by using a large number of individual insurance policies or via other insurance techniques—a thorough reappraisal of its property insurance program may well be in order.

PATENT SYSTEM CHANGES PROPOSED BY VANNEVAR BUSH

- **Patent Office should employ a larger staff and make wide use of computers to facilitate search for prior art.**
- **Description of invention should be published prior to patent issuance to provide opportunity for others to challenge the invention.**
- **Congress should legislate specific and restrictive criteria for determining new inventions.**
- **Law should let Commerce Dept. establish administrative tribunals to rule on scientific facts in patent litigations.**
- **In certain cases involving restriction of trade, patent owners should be forced to license patents at reasonable royalties.**

Harder to Get, Harder to Invalidate

U.S. chemical process companies may find future patents harder to come by, but—once issued—less likely to be challenged.

These are changes—already suggested by one expert—that could be recommended as a result of a Congressional investigation of U.S. patent laws and their administration.

The Senate Judiciary Subcommittee on Patents, Trademarks and Copyrights—headed by Sen. Joseph O'Mahoney (D., Wyo.)—has received the first of a score of reports prepared by outside experts for use in hearings scheduled later this year. The hearings will consider whether new legislation is needed to bring the patent laws—scarcely changed in nearly a century—up to date.

The First Report: Vannevar Bush, the retired president of the Carnegie Institution of Washington, wrote the first report—a 30-page document titled "Some Proposals for Improving the Patent System."

The noted scientific administrator and governmental advisor concedes "recent tendencies" have largely undermined confidence in the patent system. But Bush would be moderate in his changes in the patent law. He is as impatient with those who would junk the present patent system as he is with others who have been inclined to accept the status quo.

Bush recommends to the subcommittee a number of specific changes he feels will help simplify the complex patent law and better adapt it to the needs of inventors, businessmen and consumers. His main proposals:

- Reduce the number of patents involved in litigation by establishing, at an earlier time, whether or not there is "prior art" on the subject. This could be done, Bush feels, by providing larger funds for the patent office staff, and by making wide use of computer devices to help examiners in their search through document files—a search carried out to make sure an application covers a new, previously unpatented invention. This mechanization, Bush writes, should cover published technical and trade journals as well as previous patents.
- Give third parties an opportunity to oppose issuance of a patent before final action is taken. This would require that a description of the invention, in general terms, be published before a patent is issued.
- Patents should be granted, Bush says, only in situations where such protection is needed to bring a useful invention into production and so promote business competition. To guarantee this, Congress would have to legislate more specific and restrictive criteria for determining what constitutes a new invention.
- Jurists should be freed from having to rule on any but the legal issues in a patent case. Bush would accomplish this by establishing special administrative tribunals in the Commerce Dept. to rule on the scientific facts in litigations. He would have the determinations of these hearing boards be binding in the courts.
- Bush advocates compulsory licensing at a reasonable royalty in cases (1) where restrictive patent pools result in industry domination, (2) in situations where a newcomer can be denied entry into an industry because others perpetuate their patent control through improvement patents, (3) in cases of antitrust violations, and (4) where there has been "unreasonable" patent suppression.

Blunt Bludgeon: The antitrust laws, Bush contends, are a "blunt bludgeon" for dealing with the subtleties of the problem of patent licensing. He believes licensing of all comers at small royalties may produce just

such "deadly inertia and lack of initiative" in an industry as the patent system is supposed to forestall.

Yet, he says, "destroying the patents by requiring free licensing may be even worse."

Bush, in discussing the drawbacks to open patent pools, cites the automobile manufacturing industry as a case in point.

"An industry fully cross-licensed at small royalties," he reports, "is likely to be pedestrian in its advances. Its attention will be devoted to minor advances, and to public appeal of relatively inconsequential nature. It is likely to lean on its suppliers for its innovations."

Vigorous Competition: "We want vigorous competition," the noted administrator says, "on technical as on all other aspects, and courageous pioneering. True, this may be expensive and cause local distress at times," he argues, "although this is the price of progress."

The Bush report will be followed by a dozen others. Two of them—a review of the patent system in terms of its function and operation in today's economy, by Chicago Attorney George Frost, and a statistical compilation, by the Patent Office, analyzing ownership of patents issued since 1939—are now on the press.

The Frost report—reflecting the dominant view of the patent lawyers' associations—will defend, in general, the present system. The Patent Office data—which will include an analysis of patents issued to 176 large corporations—shows that corporations got 59% of all patents issued during the 16-year period covered by the patent attorney's report.

General Electric and its corporate affiliates led all corporations, receiving 10,757 patents. Du Pont was fifth, with 6,338 patents issued since 1939; Esso Standard, sixth, with 4,899; Eastman Kodak, eighth, with 3,784; and American Cyanamid, tenth, with 2,872.

The extent of future patent law changes remains to be seen. But changes are certain, for, as in Canada (*CW, Dec. 15, '56, p. 36*), the U.S. has seen fit to make a detailed patent law study. For the U.S. chemical process industry, the current investigation may result in a patent system with new concepts of patents as business assets.

LEGAL

'Good Faith' Defense: The "good faith" defense to charges that a supplier has discriminated among its customers by charging varying prices is due to come up before the U.S. Supreme Court again, and the outcome could be an end to what Rep. Wright Patman (D., Tex.) has termed "a large loophole" in the Robinson-Patman Act (*CW, Sept. 8, '56, p. 58*).

The high tribunal has agreed to review the 17-year-old "Detroit case," in which the Federal Trade Commission issued a complaint accusing Standard Oil Co. (Indiana) of selling gasoline to Detroit jobbers at prices below those charged some 350 service stations in the area. Indiana Standard said the lower prices were offered in good faith to meet the equally low prices of competitors.

The high court in 1951 agreed that the good-faith plea was an absolute defense against a charge of illegal price discrimination, and sent the Indiana Standard case back to FTC to decide if the company's price cuts were really made in good faith.

FTC ruled that the prices in question weren't established in good faith to meet specific prices set by competition. An appeals court overruled the commission's ruling. Now, it's this decision, appealed to the Supreme Court by the FTC, that's up for review.

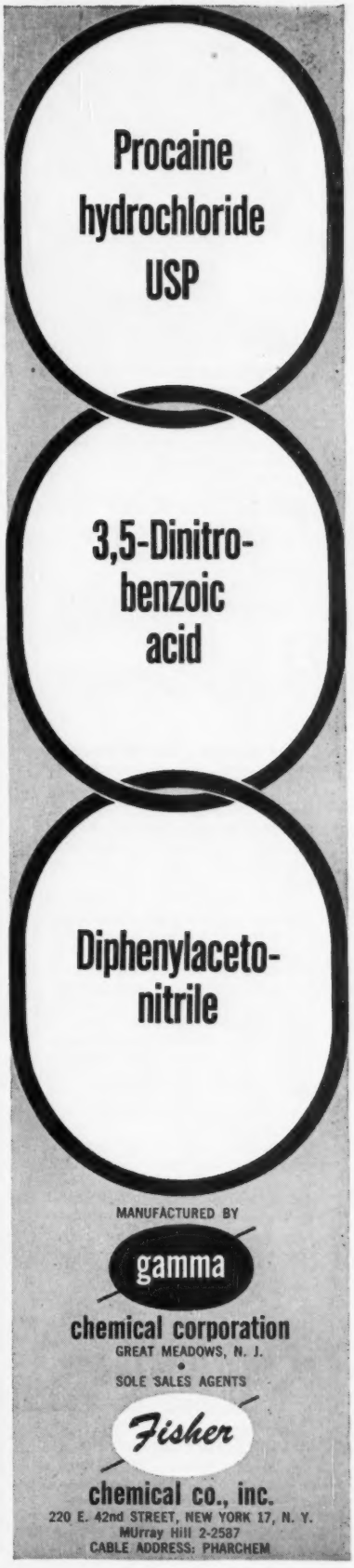
•

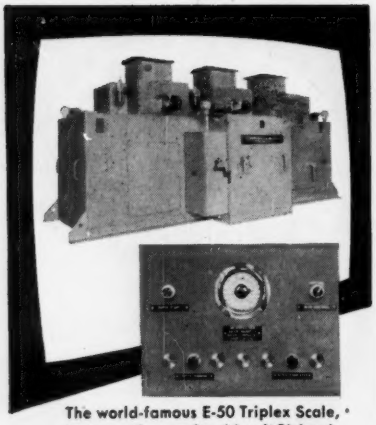
Corporate Tax Relief: The Internal Revenue Service has issued rulings on the 1954 tax code that stand to save U.S. chemical corporations a tidy sum in future transactions.

Ruling 56-668 relieves corporations from the obligation of paying the government anything beyond tax and interest. Previously, corporations were required, under certain circumstances, to pay additional interest on interest assessed on tax deficiencies.

Under Ruling 56-654, increasing the redemption price of preferred stock to better reflect a corporation's net worth—with a resulting decrease in the value of its common stock—may now be effected as a tax-free exchange.

Ruling 56-655 classifies as tax-free a corporation split-up in which cash is transferred to one successor corporation to make the value of assets distributed to it correspond to the value of assets distributed to the other component.





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Why Students Shun Science

Among high school students polled by Purdue Opinion Panel—

- 14% think there's "something evil" about scientists.
- 30% believe that a scientist can't have a normal family life.
- 9% believe that a person can't be a scientist and be honest.
- 25% think scientists as a group are more than a little bit "odd."
- 28% don't think scientists have time to enjoy life.
- 35% feel that one has to be a genius in order to become a good scientist.
- 27% think that scientists are willing to sacrifice the welfare of others to further their own interests.

Student attitudes about research chemists and their work:

- "This vocation is all right, but I wouldn't want it for myself"—18%.
- "I wouldn't take this kind of job under any circumstances"—9%.
- "The most lasting satisfactions in life come to one in this work"—21%.
- "Not sufficiently appreciated by the general public"—14%
- "Detrimental to society and the individual"—7%.

Roadblock: Bias on Science

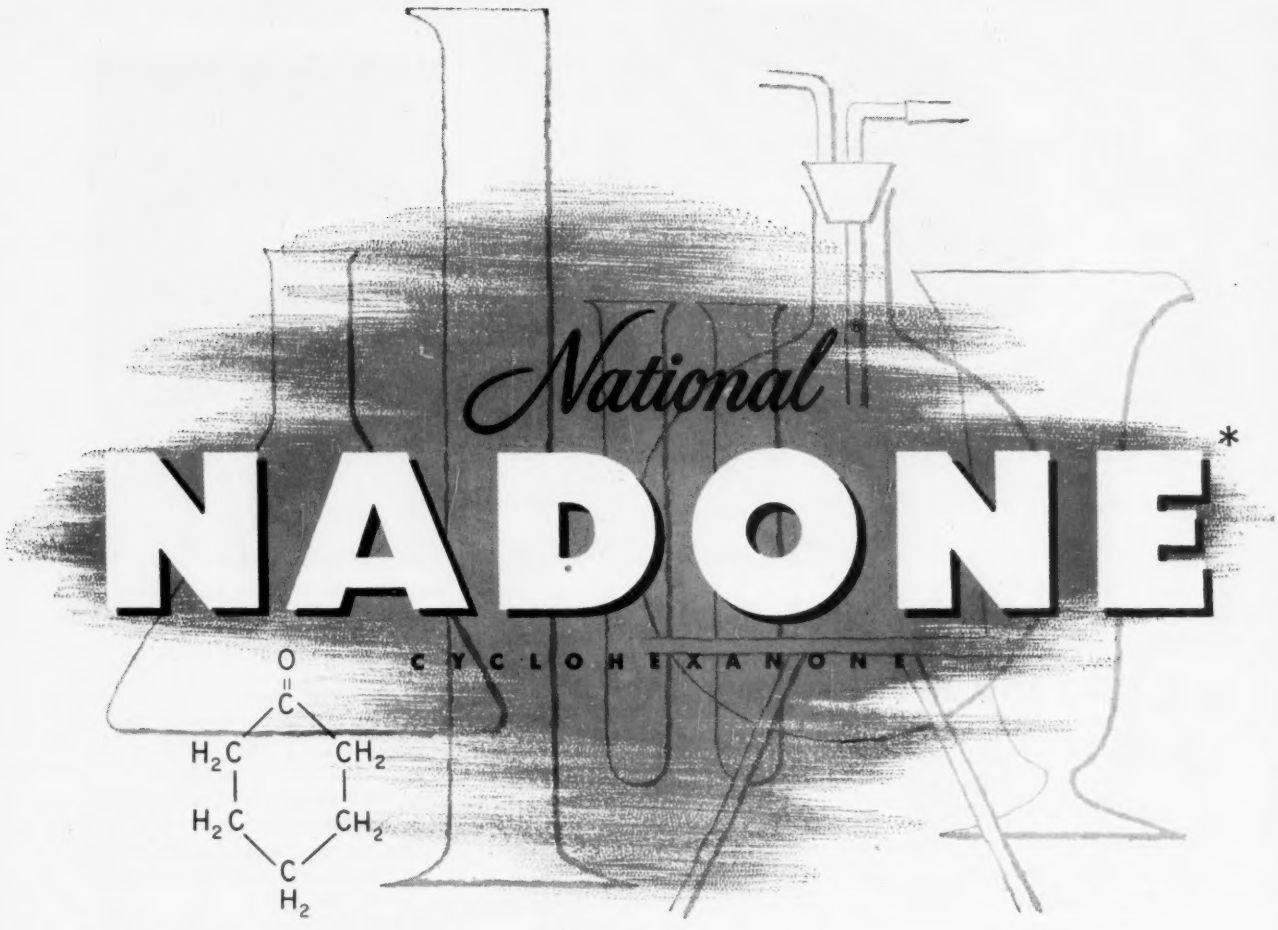
Current efforts by various industry, professional and government organizations to bring increasing numbers of young people into scientific and engineering careers are likely to run into outright hostility on the part of a certain minority of students.

It's generally agreed, of course, that there's a disappointingly low level of interest in science and technology as professional pursuits. At the close of its convention in New York last week, the American Assn. for the Advancement of Science adopted a report linking the country's scientific manpower shortage with the public's low interest in science. The report goes on to note that "well rooted in the opinions of young people" is a negative attitude toward scientists—exemplified by such epithets as "egghead" and "longhair."

But besides such indifference and mild disdain, there appears to be a more intensely antiscience attitude among one-fifth of all high school students—many of whom might be able to do well in science.

Existence of this antipathy toward science is indicated by a recent poll of a "nationally representative sample of high school youth" by the Purdue Opinion Panel (*see table, above*). The poll also revealed, of course, that the majority of students thought very well of science and engineering.

One meaning for management: that industry has a stake in helping science educators and government persuade young people that scientists and engineers are not generally "eccentrics, sorcerers, and rascals."



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E-6

VITRO ENGINEERING— and the New Age in India

VITRO Engineering Division has received the rôle of engineers to the Indian Government in building the world's largest heavy water and fertilizer complex.

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Productivity Peril: Dangers for sound money and corporate profits are seen in the fact that although the 1956 productivity gain fell short of preceding years' increases, there has been "no slackening" in workers' demands for wage increases. Guaranty Trust (New York) warns, in its monthly survey, that this is a critical problem that industrial management faces in '57. It notes, in addition, that "the tendency of wages to rise faster than productivity" threatens full employment.

•

Training for Tomorrow: Predicting that increasing numbers of women and middle-aged men will be required to fill U.S. work force needs during the next 10 years, Assistant Secretary of Labor Rocco Siciliano is calling attention to the general upgrading of jobs throughout the economy. He points out that—for the first time—the so-called "white collar" employees now outnumber "blue collar" workers. He suggests that by 1975, one-eighth of the entire work force may be made up of professional employees. Siciliano holds that "a very considerable increase in the amount and quality of training and retraining" is needed, and calls on industry to take a leading role in "fitting today's workers into the jobs of tomorrow's technology." To help with this task, the Labor Dept. is planning a new training service to prepare workers for occupations not learned through apprentice training.

KEY CHANGES

T. M. Evans, to board chairman; and **Charles L. Holbert,** to president; H. K. Porter Co. (New York).

Louis Yaeger, to director, Crown Cork & Seal Co., Inc. (Baltimore).

Eugene J. Sullivan, to vice-president in charge of sales, Chemical Division, Borden Co. (New York).

Edward F. Wagner, to manager of development, Witco Chemical Co. (New York).

Robert M. Morris, to assistant general manager; and **Howard L. Minckler,** to director of manufacturing; Organic Chemicals Division, Monsanto Chemical Co. (St. Louis).

R. D. Wise, to vice-president, Plastics Division, Drackett Co. (Cincinnati).

Ronald O. Gilbert, John W. Brooks and **Alexander R. Cochran,** to vice-presidents, Celanese Corp. (New York).

Maurice H. Bigelow, to technical director; **Werner E. Kleinicke,** to research director; and **Wolcott L. Steele,** to development director; Barrett Division, Allied Chemical & Dye (New York).

Peter A. Read, to manager of manufacturing, General Ceramics Corp. (Keasbey, N.J.).

C. J. Lockwood, to president, Socony Paint Products (Metuchen, N.J.).

Jerrold H. Ruskin, to general manager, Fine Chemicals Division, American Cyanamid (New York).

Willard C. Lighter, to executive vice-president, Glidden Co. (Cleveland).

J. D. Wright, E. A. Daniels, B. M. Van Cleve and **N. E. Van Stone,** to directors, Sherwin-Williams Co. (Cleveland).

Howard A. Scopp, to manager, polymer chemistry research, Plax Corp. (Hartford, Conn.).

Sherman K. Reed, to assistant to the president, Organic Chemicals Division, Food Machinery & Chemical Corp. (New York).

Frank B. Huke, to sales manager, Electrochemical Division, Norton Co. (Worcester, Mass.).

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DRAFTING THE PLAN: Seventeen times a year, 13 top Puritan Chemical executives plot future growth. Roundtable talks

Program Management Can Pay Off for

Can small chemical companies take advantage of the formalized, rigid planning programs that pay handsome dividends when used by the giants of industry? Puritan Chemical Co. of Atlanta, Ga. (annual sales: approximately $5 million), says an emphatic "yes." Puritan's business is sanitary supplies and industrial cleaning chemicals, and its experience with program management prompts vice-president in charge of sales, Ted Fisher, to volunteer: "It's the key to successful management in the small company."

Puritan holds 17 day-long planning meetings a year for 13 top executives. Dubbed the Program Management System (PMS) by Puritan, the method calls for pinpoint planning, has been a big factor in doubling annual sales, and is helping a planned $500,000 expansion. By fostering realistic sales and profit goals, PMS has enabled Puritan to estimate its 1956 sales to within 2.5%, its net profit to within 0.5% of the actual figure.

Seeking a method that would establish definite objectives for future planning, reduce duplication of effort, and, in effect, be a plan for planning, Puritan adopted PMS. Now three years old, it is answering many of the company's budget problems.

PMS is an adaptation of an Army planning technique. In military style, the company is divided into four tactical and support units; these are its primary programs. Because Puritan is oriented to sales, it schedules its unit presentations in this order:

- Primary sales program (tactical).
- Primary chemical development program (transition from tactical to support).
- Primary production program (support).
- Primary administrative program (support).

Each fall, Puritan holds a series of four one-day meetings during four consecutive weeks. One day is allotted to each of the four units. The sessions, scheduled a year in advance, are called primary program development meetings—top priority items for Puritan's management. Those who attend, and their planning duties:

- President and chairman of the board—no specific primary program duties.
- Sales vice-president—directs entire primary program and the primary sales program.
- Northern and Southern divisional sales managers, administrative sales manager, advertising manager and sales training director — assist sales vice-president.
- Production vice-president — directs primary production program.
- Production manager—assists production vice-president.
- Technical director—directs primary chemical development program.
- Secretary-treasurer, budget director and business manager—direct primary administrative program.
- Controller and purchasing agent —assist the secretary-treasurer.

Each of these men attends all meetings. At each session, the director of the program under consideration must present three statements:

- **Mission.** A description of the kind and scope of functions carried on as part of the primary program.
- **Operations.** A presentation of de-

and laboratory visits are all part of the system.

Small Firms

partmental programs emanating from the primary program.

• **Goals.** A statement that suggests objectives and timetable for achieving them. The objectives may be approved, amended so as to be approved by the group, or rejected.

After the four primary program sessions, there is a lapse of about two months with no planning meetings. During this time, the budget is being developed, since the three necessary elements for budgeting have been brought out at the four primary program development meetings—sales volume estimate; anticipated profit; planned expenditures.

Plans and Figures: Finally, late in December, the budget is reconciled with planning at the primary program changes and budget estimates meeting. This is the session in which, as Fisher puts it, "something must give." For example, perhaps the primary production program will have to delay purchase of some of the trucks it had planned to buy next year, or perhaps plans for increasing the sales force must be trimmed. Adjustments

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H_2NOH + $C_2H_5OCH{=}C(COOC_2H_5)_2$ → + $2C_2H_5OH$

hydroxylamine

4-carbethoxy-5-isoxazolone

R–C_6H_4–NH_2 + $C_2H_5OCH{=}C(COOC_2H_5)_2$ → + $3C_2H_5OH$ + CO_2

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are made, and a budget is adopted.

Also at this meeting, any one of the four primary program directors who has changed his mind about some phase of his plan can request approval of a program change by the group.

To keep tab on progress of the four primary programs, Puritan has quarterly groups of review and analysis meetings held on four successive Saturdays. Sequence is the same as that of primary program development meetings, i.e., sales, chemical development, production, and administration. Here again, a primary program director may ask approval of a change in his plan, but the substance of the series is a presentation of how closely plans for each program are being carried out.

Other meetings—of somewhat less importance—are also held. Once a month, the junior staff members and department heads join the primary program group for an operations board meeting. These are informal briefings on departmental activities.

Planning Payoff: Besides the advantage of providing a timetable and a base for planning, the PMS-type formal planning has a less obvious but extremely important benefit.

"It seems to impart a sense af assurance to everyone in the company," says Fisher. "Each December, salesmen are called in for an annual meeting at which they are filled in on our accomplishments for the year that is ending and on objectives for the coming year. While the salesmen are en route, a copy of information is sent to their wives to apprise them of the planning and to emphasize that we consider them an important part of our company."

The Program Management System's ability to provide for long-range planning eliminates a time-consuming bugaboo for a concern the size of Puritan. Most small companies, says Fisher, argue that the necessary meetings are too time-consuming. "To me, that's like saying 'we can't afford time for good management.' "

Until recently, Puritan never attempted detailed planning for more than two years ahead. In 1957, it will have a five-year program.

"This is just one more way our planning efforts have paid off," Fisher reports, "and I'm betting that other benefits we haven't yet thought of will be popping up in the future."

Package for the Farm

American Cyanamid moved another step "closer to the customer" this month by establishing its new Farm and Home Division.

The division consolidates the Animal Feed and Food Industry Depts. (taken from the Fine Chemicals Division), veterinary product sales (from Lederle Laboratories), and some agricultural chemical products (from the Agricultural Chemicals Division).

The company has renamed the Agricultural Chemicals Division the Nitrogen and Allied Products Division. It will now handle only bulk sales of fertilizers, mining chemicals and insecticides. The Fine Chemicals Division will restrict sales activity to bulk pharmaceuticals. Farm and Home, however, will handle bulk sales of feed supplements.

Purpose of the move, say Cyanamid officials, is to further penetrate the packaged goods markets; the new division was set up explicitly to promote "all agricultural chemicals that lend themselves to packaged form." Thus, the new division will handle such items as Acronize, Cyanogas, lawn and garden plant nutrients, aminotriazole and Thimet.

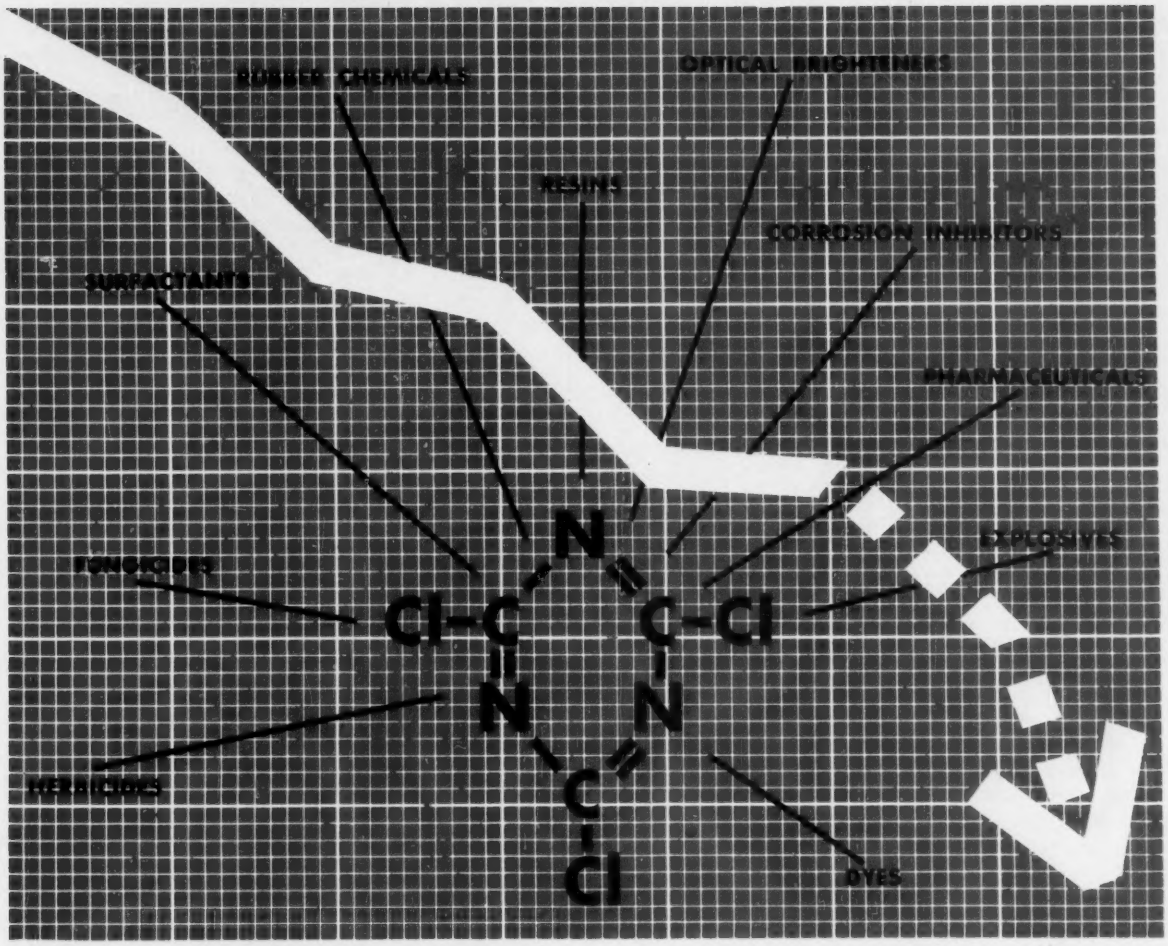
Cyanamid has no plans for reorganizing the basic sales structures of the departments comprising the new division. Future organizational changes will depend largely on the type of new products the group handles.

Cyanamid is hoping the move will improve coordination. The new setup, for example, will facilitate solving the sales problems posed by competition of two different forms of a product. And products that have received only limited promotion in a division that sold to many diverse markets will now get more attention.

To house the new division's development work, a large agricultural center will be built near Princeton, N.J. Its main function will be to put research into marketable form.

Product development groups for ruminants, swine, poultry, small animals, plant health, and food will all make use of the center. Technical service, too, will operate out of the proposed center. The farm will centralize agricultural product development, enhance communications and coordination.

The division will be headed by A. B. Clow.



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SALES

Formula for Fertilizer Confusion?

Fertilizer producers are taking sides on one feature of the model state fertilizer law now being pushed by the Assn. of American Fertilizer Control Officials. AFCO, operating mainly at the state organizational level, wants the industry to change its long-used basis for reporting phosphate and potash content in fertilizer.

Labels on bags now cite amounts in terms of oxide content. The proposed change would require listing in terms of elemental forms of phosphate and potash instead.

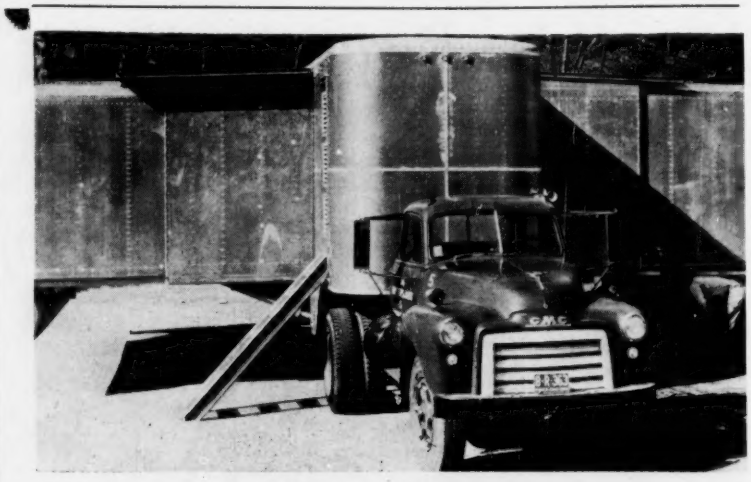
A 10-6-4 formula under the present system would be expressed as a 10-3-2 formula under the AFCO proposal, although the amount of phosphate and potash would remain the same. Manufacturers say it would be hard to explain this to most users and that the resultant "confusion" isn't worth the simplification in reporting that AFCO thinks the change would promote.

The National Plant Food Institute's directors have voted to fight the proposal in state legislatures, following a membership poll in which 67% of those responding were against the AFCO proposal.

In Favor: Some large producers, especially phosphate manufacturers, are expected to vigorously back AFCO's proposal. Olin Mathieson has already declared in favor of the new labeling scheme. Manufacturers of fertilizer, believes OM Vice-President S. L. Nevins, will experience the greatest boom in their history, once the confusion of outdated labeling practices is expelled.

The proposed changes, says Nevins, will "simplify teaching fertilizer technology by eliminating the difficulty of explaining meanings of grades and ratios. "To continue outdated usage," he avers, "is to hoodwink the farmer by making analysis appear bigger than it does when expressed wholly as elements. Condoning this [practice] is not becoming to our industry." Nevins avers that the changes are practical and no reason for a price increase.

Support for AFCO's position is also coming from the American Society of Agronomy, Soil Science Society of America, Experiment Station Directors Assn. of the Western and North Central Regions and the Assn. of Southern Feed and Fertilizer Control Officials.



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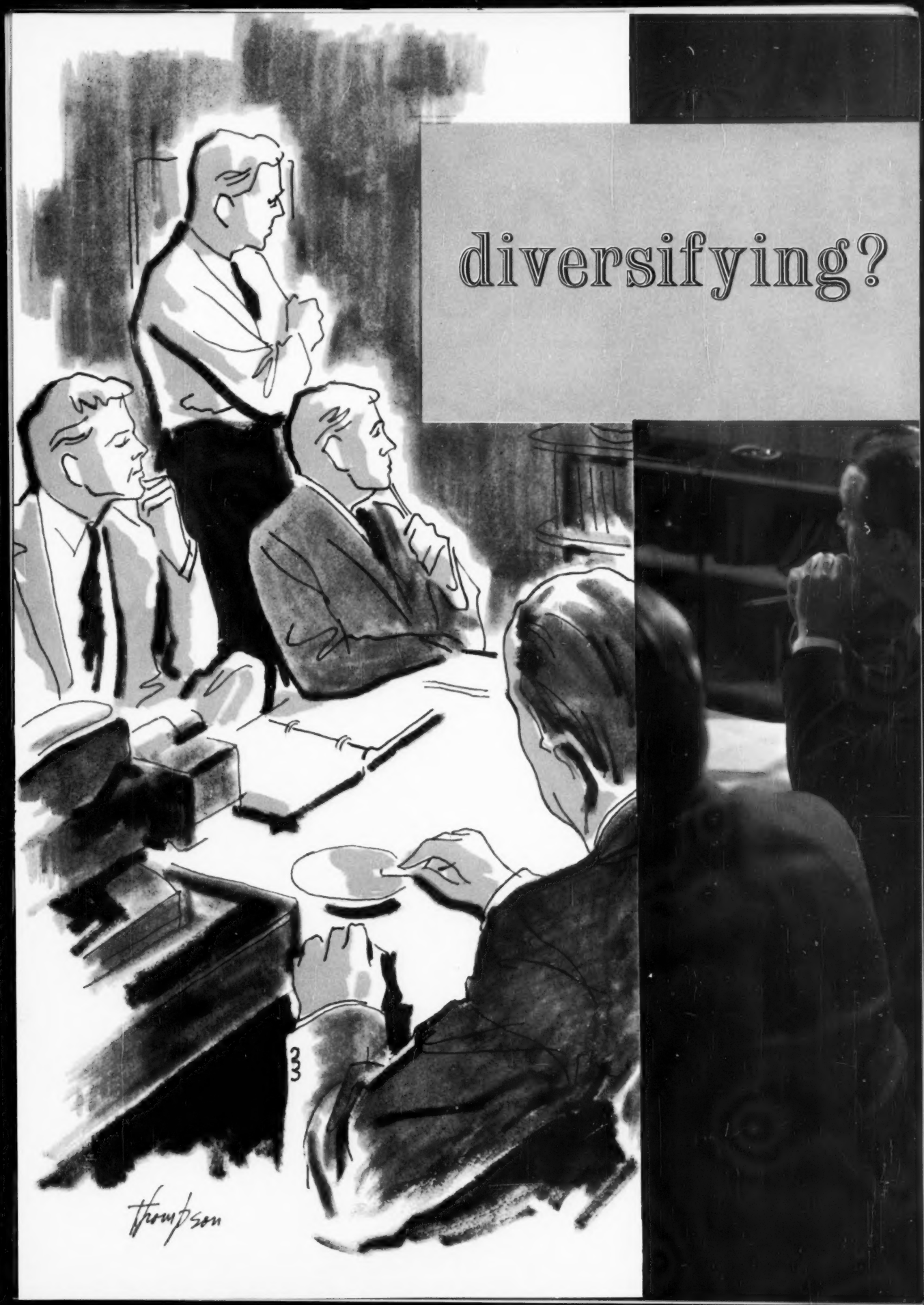
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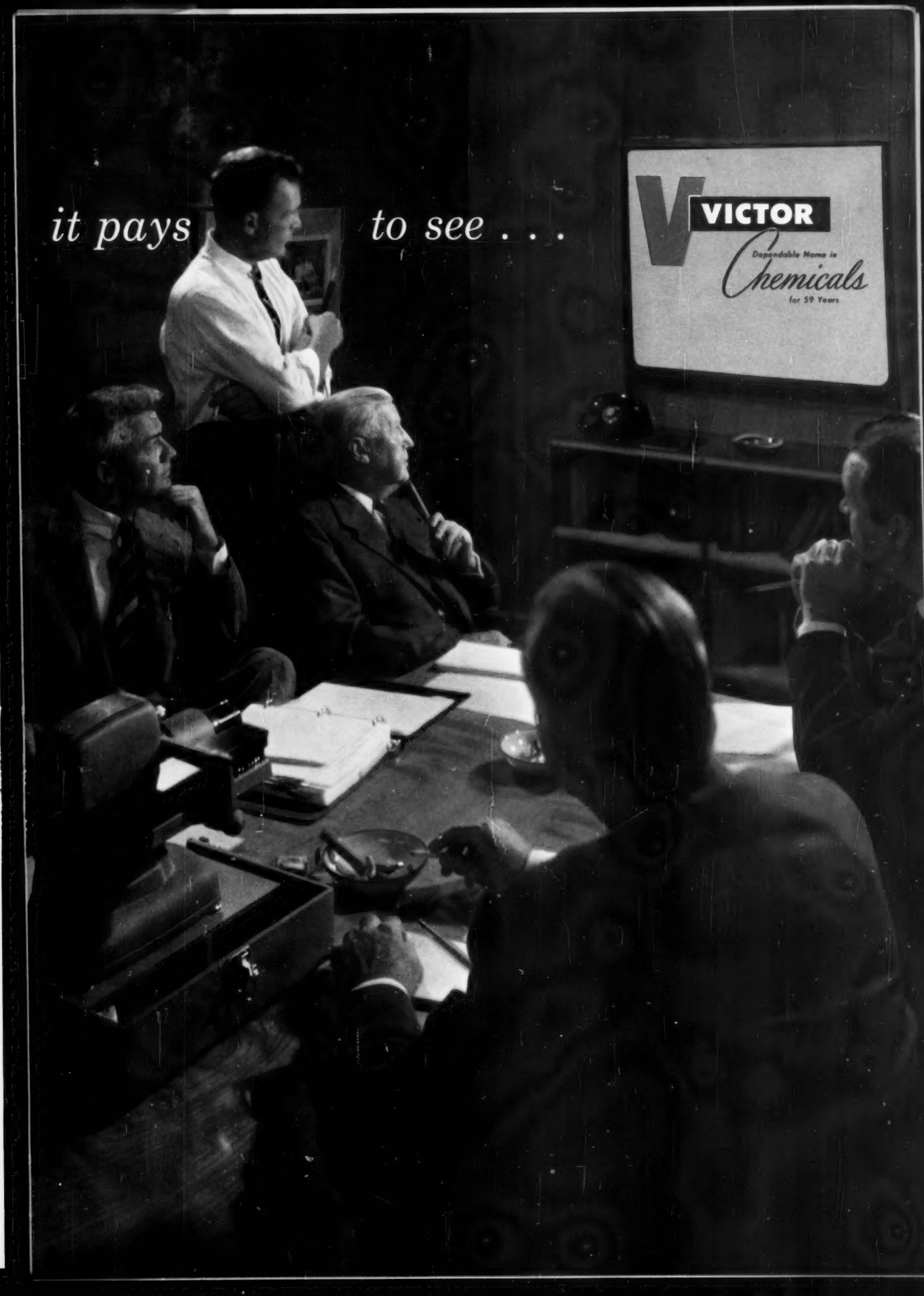
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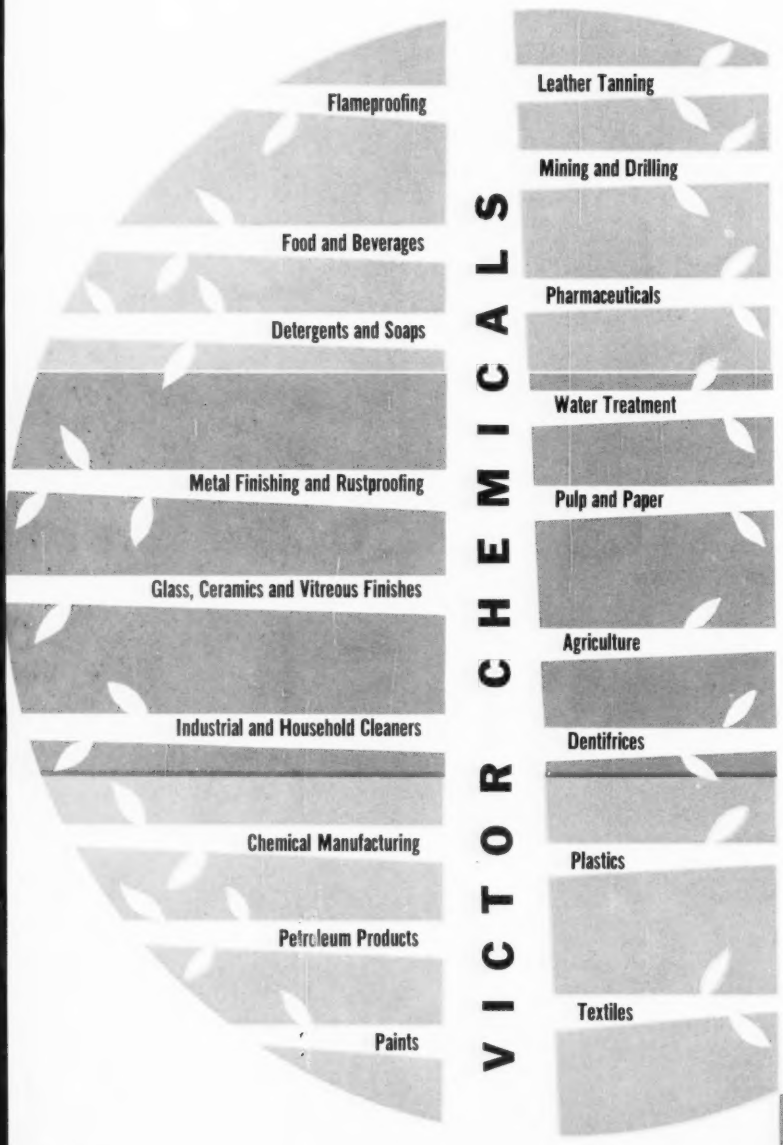

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The case for a lease-back laboratory—

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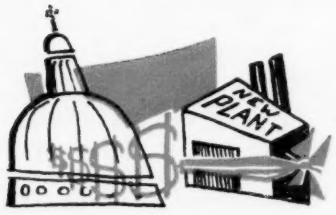

TAX ADVANTAGES accrue in some cases; thus, money that formerly went into tax payments is freed for expansion use.

OPTION TO RENEW is at a rate considerably lower than the rate specified in the original contract.

Rent Your New Research Lab?

Pressed for working capital, unwilling to take on more debt, some chemical process companies are seriously considering a cutback in research expansion plans. Others, in the same predicament, are taking another look at the "sale lease-back" principle—an increasingly popular gambit for securing research real estate with a minimum cash outlay. If you're not a good credit risk, however, lease-back is not for you.

A technique in real estate transactions that has made great strides since World War II,* lease-back works this way: An institutional investor (e.g., an insurance company) or mortgage broker is sought out by the firm desiring new facilities, is told the type of building, location, etc., desired. The institutional investor or broker buys property (or may even build to specifications), then rents it to the applicant on a long-term basis (usually 25 years with option to renew at the end of that period). Usually, only the land and building are included, equipment is installed by the lessee.

At least one company—International Minerals & Chemical Corp.—is now in the process of such financing. IMC originally bought land and built its own research laboratory in Skokie, Ill. The firm has recently

* After which the insurance statutes of many states were liberalized, allowing insurance companies to invest in income-producing commercial real estate. At the same time, companies with pent-up expansion plans (deferred because of the war) and high income taxes often found it more profitable to rent property than to buy it outright. Lending institutions fixed rent at a level to permit recovery of their investment, plus income, at the end of the rental term, but not as high as individual landlords would receive.

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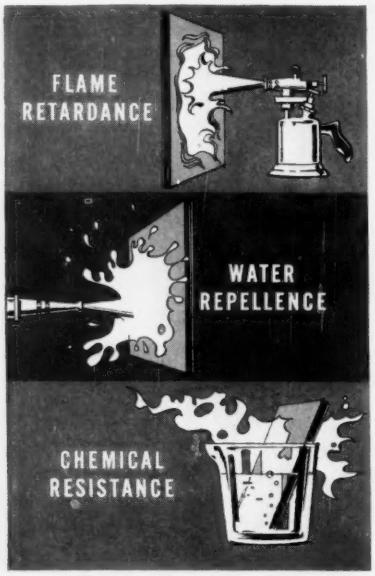

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sold the property, is now leasing back land (but not equipment) and laboratory. General offices, which are being built, will also be leased back. Total value of site and property: about $1.5 million. The arrangement will free IMC capital for other investments.

Olin Mathieson, contemplating construction of a new research laboratory, is considering lease-back financing. American Machine & Foundry, planning a central research laboratory in Westchester County, New York, will probably seek a lease-back deal.

David Meiklejohn, AMF treasurer, says: "We now have a policy of leasing all our principal plants. We're expanding, feel that our cash resources can be more profitably employed as working capital than having it invested in real estate."

Sylvania Electric recently entered into a lease-back arrangement for its new avionics and missiles laboratory at Waltham, Mass.

Capital Consideration: Proponents of lease-back for laboratory financing are almost unanimous in citing conservation of capital as the main advantage of the arrangement. An investment in new production facilities may be returned in one or two years. But the return on a research laboratory is much longer in materializing.

And lease-backs do not appear as a debt on company books, enhance the firm's credit position to stockholders (although sound accounting practice requires that the lease-back item appear on the balance sheet).

There may also be tax advantages to seller-tenants because rent payments are fully deductible. Moreover, whereas depreciation allowances are limited to the buildings, rent payments cover both land and buildings. Still, this benefit is questioned by some real estate analysts, who have found that rent deductions often do not materially exceed deductions that would have been available to the lessee (through depreciation and interest) had he bought the same facilities with borrowed funds.

Seller-tenants also anticipate another saving: at the end of the lease-back contract, the renewal rate should be considerably less than the original rental fee—because the cost of the building is written off during the period of the original contract.

Nothing to Show: Of course, a company that has paid rent has no property to show for its expenditures at the end of the lease. But some realty men see some benefits even in this prospect. They reason that at the end of 25 years, for instance, a research building may be obsolete or too small for the lessee's needs.

Lease-backs admittedly are expensive. The expense, however, depends largely on the lessee's credit standing. For prime credit risks, the lease-back rental rate may be no higher than the cost of mortgage and interest payment. The only extra charge is for a fee to the investor or mortgage broker who arranges the lease-back financing, helps in selection of a suitable site, etc.

Performance Is the Key: Money for financing lease-back projects generally comes from banks, insurance companies, pension and trust funds. Credit is based on an applicant firm's past performance, position in its industry, continuity of earnings, soundness of management, etc.

One mortgage broker reports a growing trend to shorter-term leases (5, 10, 15, 20 years). Therefore, besides such leases, he offers a "swap" clause whereby a fast-expanding client is allowed to break its original contract, then enter into a new one for a larger building. The rental fees for these speed-up plans, though, are higher than those for the long-term plan.

Lending institutions tend to be especially particular in lease-back deals because the lender may be left with a highly specialized, hard-to-dispose-of building if a client defaults on its obligations.

Small young firms find it especially difficult to swing a sale and lease-back deal. Reason: there's always doubt that they will endure for the duration of the lease.

Here to Stay: Any form of long-term expansion that is founded on debt—and is therefore tied to rising interest rates—requires a good deal of premeditation. For companies that are growing, however—and today that covers a lot of ground—the mental effort makes sense. Research real estate isn't as likely to pay as high a return on an investment as is money plowed into research equipment, production facilities, or salaries for high-caliber researchers.

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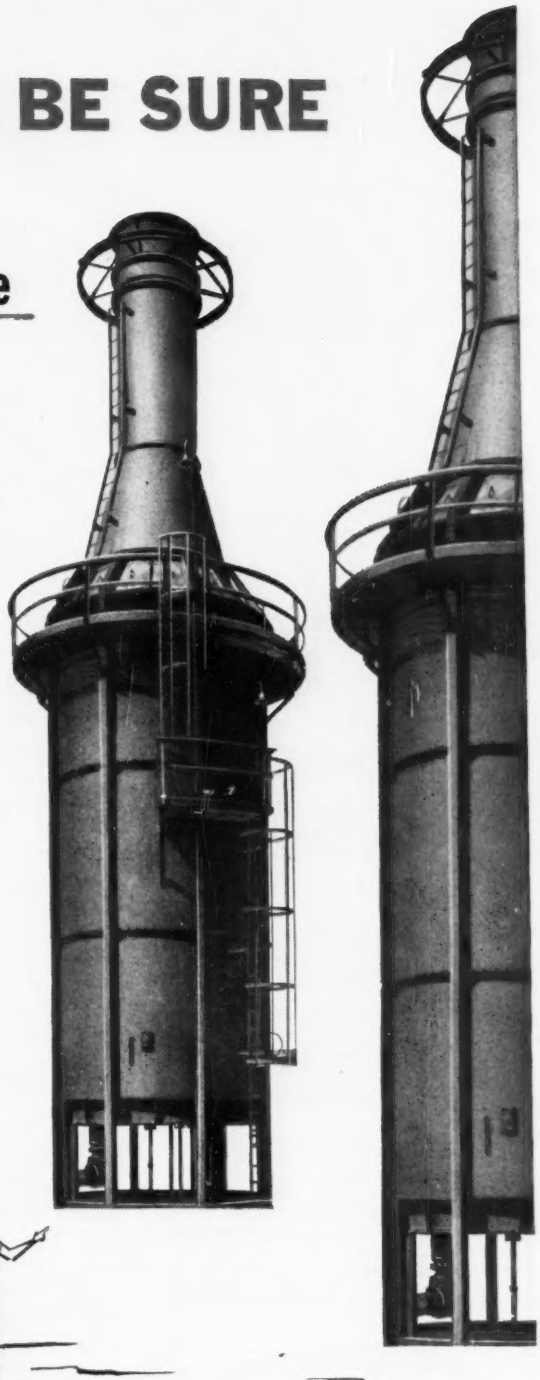

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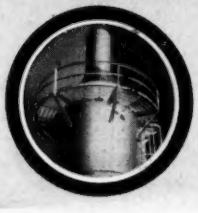

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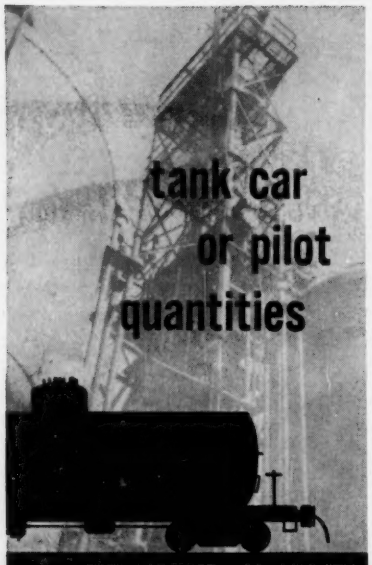

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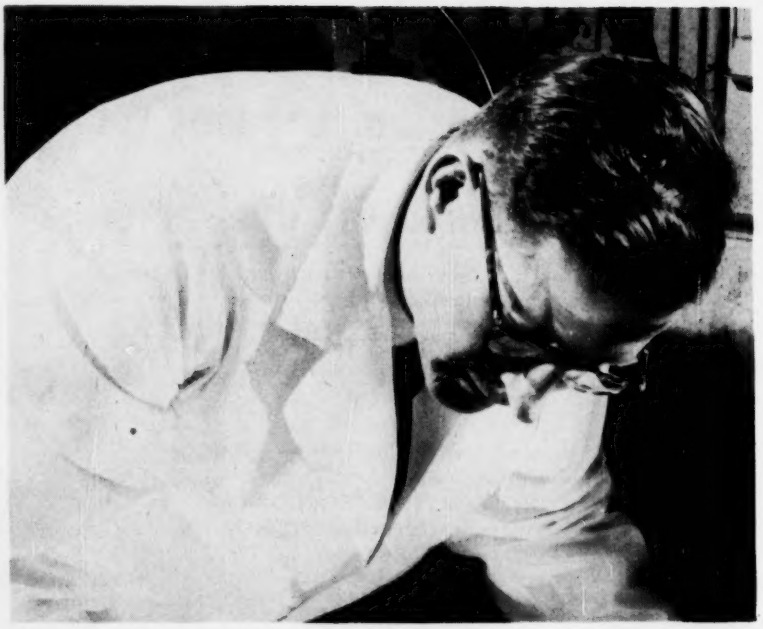

GE'S PAINE: From iron 'dust,' permanent magnets.

Bar to Demagnetization

A happy marriage of chemical research and theoretical physics at General Electric has produced a new magnet that keeps its strength under conditions that drain the power of older magnets.

Composed of ultrafine (about 0.-000001 in.) iron particles in a plastic, rubber, glass or metal matrix, the new magnet could lead to more compact electrical instruments, find use in nuclear-reactor technology.

Thomas Paine, manager of GE's Measurements Laboratory, Instrument Division (Lynn, Mass.)—and head of the research team that turned up the magnet—went on the theory that tiny, elongated iron particles should have high resistance to demagnetization—a basic requirement of any permanent magnet.

But making suitable elongated iron particles (they tend to grow round) wasn't easy. GE finally came up with this technique to make the particles:

Iron is electrolytically deposited from an aqueous electrolyte into a molten metal (e.g., mercury, lead-bismuth alloys) cathode. Result: supersaturation of the liquid metal with iron. The minuscule iron particles nucleate and grow rapidly, yield particles that are identical in chemical composition and crystal structure to ordinary iron, yet feature 100,000 times the latter's resistance to demagnetization.

After the particles are made (a billion billion of them weigh a pound), they are aligned by a powerful magnetic field, compacted under high pressures with an appropriate binder.

Right now, the newcomers are equal in strength to commercial magnets, but it's said that theoretically they can be made 10 times more powerful. Moreover, they can be machined, drilled, tapped and molded into desired shapes. And, GE reports, they can be made with completely reproducible properties. One feature that bodes well for their future in nuclear reactors is resistance to radiation.

Magnet-researching Westinghouse Electric Corp. (Pittsburgh) reports that it has no equivalent to GE's new magnet in the immediate offing. But Westinghouse is continuing studies of its highly promising manganese-bismuth chemical lodestone (*CW, June 30, '56, p. 72*).

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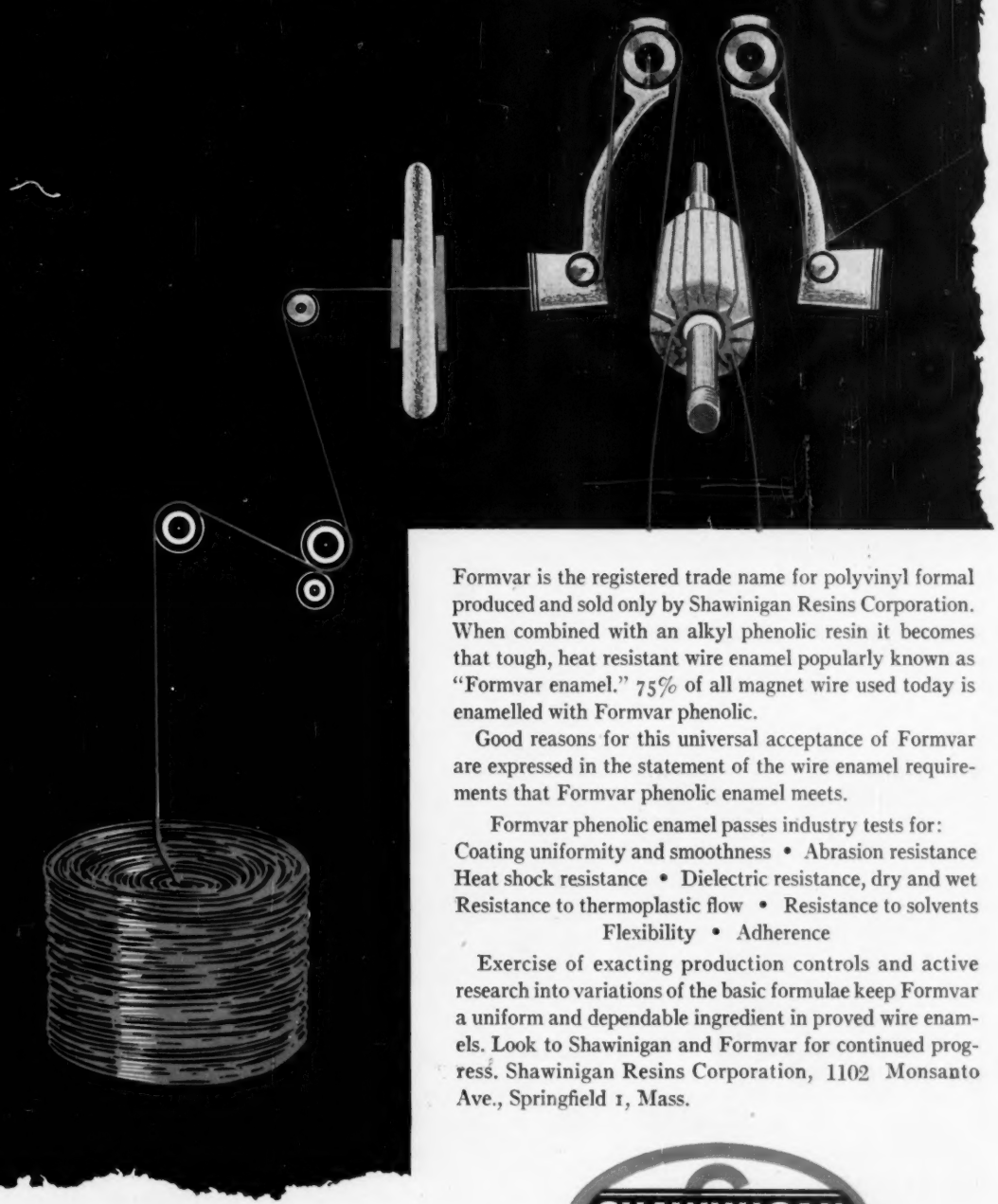

Formvar is the registered trade name for polyvinyl formal produced and sold only by Shawinigan Resins Corporation. When combined with an alkyl phenolic resin it becomes that tough, heat resistant wire enamel popularly known as "Formvar enamel." 75% of all magnet wire used today is enamelled with Formvar phenolic.

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A New Tack on Smog

A new invention to rid autos of their smog-producing propensities has recently been developed by UCLA professor (and thermodynamicist) Richard Kopa and a team of student researchers. The device injects a mist of tap water into the carburetor's air intake, is designed to eliminate oxides of nitrogen, which (along with hydrocarbons and sunshine) are considered important in smog formation.

Nitrogen oxides are formed during combustion. The water mist reportedly reduces combustion temperature from the peak at which most of the oxides are produced, thereby cuts oxide formation. Kopa uses about one-half gallon of water per gallon of gasoline. He reports that oxides were reduced by 90% (in tests during the past year using a Ford V-8 engine), without affecting the power or efficiency of the engine or causing corrosion.

Not new, water injection has been used on aircraft and racing cars to reduce knock and engine temperature. But, to the best of Kopa's knowledge, it's the first time this type of device has been applied to the smog problem.

Some experts speculate that the device might be used in conjunction with a fuel-cutoff system, the former to cut nitrogen oxide in acceleration and cruising, and the latter to minimize loss of hydrocarbons to the air when the auto is decelerating or idling. Kopa himself thinks the water injector will do the job alone. Meanwhile, there's no indication when the device will be marketed (estimated cost $50). UCLA is applying for the patent.

Los Angeles smog control authorities don't want to be quoted on the development. They are lukewarmly interested, point out that, although autos are a major source of nitrogen oxides, they are far from the only source that figures in the smog problem.

Building a Better Heat Barrier

LIQUID HYDROGEN, helium and nitrogen, which are cooled to temperatures as low as —450 F, are expensive to make, difficult to store. But they're essential to research into low-temperature behavior of metals now in progress at the National Bureau of Standards' cryogenic engineering laboratory (Boulder, Colo.). NBS researchers, headed by physicist Marion Fulk (*above*), report they are able to insulate liquefied-gas storage containers more effectively than ever. Key: a mixture of aluminum powder, Santocel (silica aerogel), perlite and diatomaceous earth placed in the evacuated space between the wall of the inner tank (containing the gas) and the outside wall of the container.

Fulk is shown determining the amount of heat transferred through test powders by measuring evaporation loss of liquefied gas.

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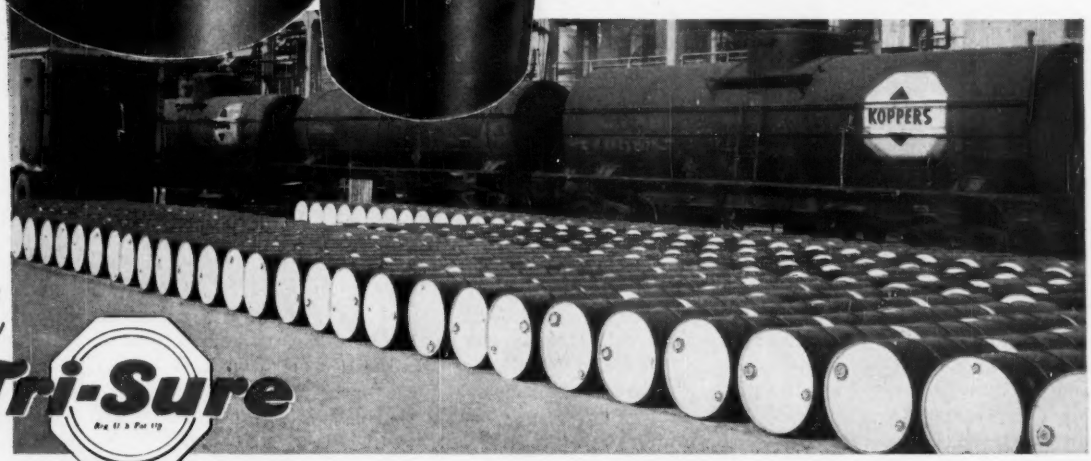

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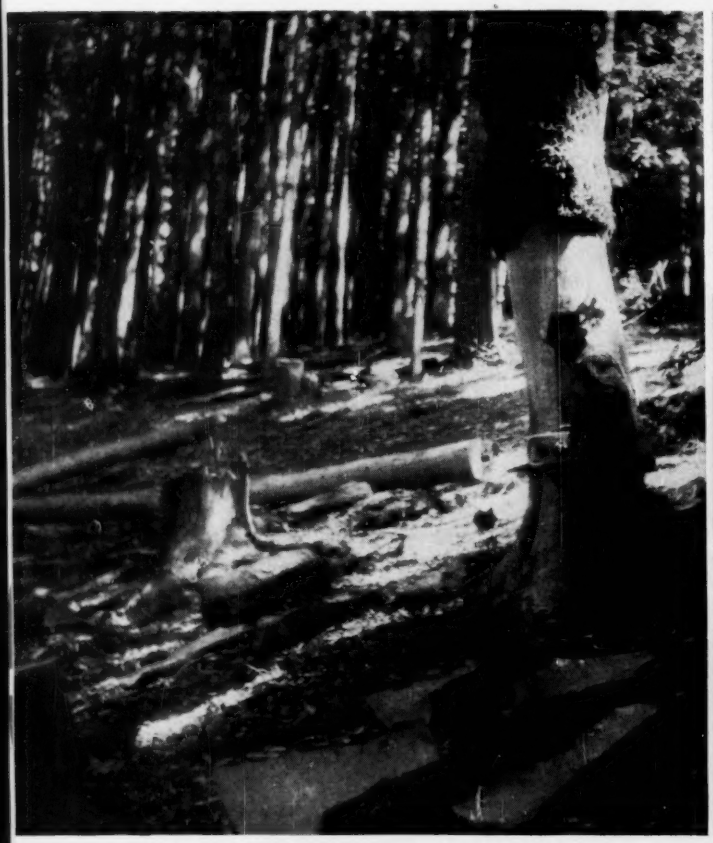

TANNERY IN FOREST: Stack of oak bark is raw material in new extraction-concentration process for . . .

Muzzling Tanbark's Bite

For the past six years, A. K. Salz Co. (Santa Cruz, Calif.) has been modernizing the centuries-old tanning process by which it produces California Saddle Leather. To date, improvements that have cost the company over $300,000 have paid off—says Salz—in a 30% production increase with 10% less manpower. And the firm is looking forward to an even bigger payoff from its latest process innovation—a tannin extraction-concentration process now being piloted at the Santa Cruz tannery.

To get the special tannins required for its premium-grade leather,* Salz now has to move mountains of tan oak (*Lithocarpus densiflora*) bark from remote northern California forests. Because the bark can be stripped only while the sap is running, an entire year's supply must be transported during the brief 4-month bark-harvesting season. And the tannery must keep one extra year's supply—some 4,600 tons—on hand to guard against supply failures due to forest fires, other natural hazards. But if the pilot-plant tests of the new process are successful, Salz plans to go to the mountain, tapping off the vital tannins at their source.

Extraction of the water-soluble tannins by grinding and leaching the thoroughly dried bark (if bark is wet, it pulps instead of shattering) presents no special problems, recovers about 75% of the 18%-tannin content. But bark treatment in the forest requires additional steps to concentrate the tannins for shipment, to reconstitute the material at the tannery. The pilot plant has already produced satisfactory concentrates in both high-tannin liquid and spray-dry powder forms. All that remains to be worked out now is the tricky job of duplicating with tannin concentrates the tanning action of freshly extracted bark.

Updating an Art: The tannin extraction process is only one of many processing innovations instituted by Salz' youthful president, Norman Lezin. When he took over in 1950, † outdated production techniques and antiquated material handling proce-

*Salz' tanning process uses only natural tannins to preserve the surface of the leather without destroying its distinctive scars and other natural markings. California Saddle Leather is priced around 55-57¢/sq. ft., about 50% higher than average high-quality, top-grain leathers.

†Though Salz was purchased by Pacific Industries, Inc., last October, the company is still under Lezin's management.

dures had brought the plant to the brink of collapse—despite a high demand for the premium-grade leather.

The very nature of the product complicated Lezin's task. Unlike most of the leather industry, which operates on a low-margin, high-volume basis, Salz' business is essentially long-margin, low-volume. Lezin's remedy for soaring labor costs and overhead: wholesale adoption of modern production techniques.

Some of the streamlined methods put into effect by Lezin have reduced hide handling time from days to minutes. For example, the old method of resalting hides by hand prior to storage required three days to process a truckload of hides. Today, the same quantity can be palletized and stored in just 40 minutes. What's more, Salz' $75,000 hide storehouse is specially designed (most tanneries use converted warehouses) to accurately maintain 75% humidity at 36 F, serves the double purpose of rehumidifying dried-out hides while storing them.

The finishing of tanned hides has

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TANNIN CONCENTRATE may replace mountainous bark storage piles . . .

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Gravies-Sauces—prevents fat separation.
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Can you add other uses to this list?
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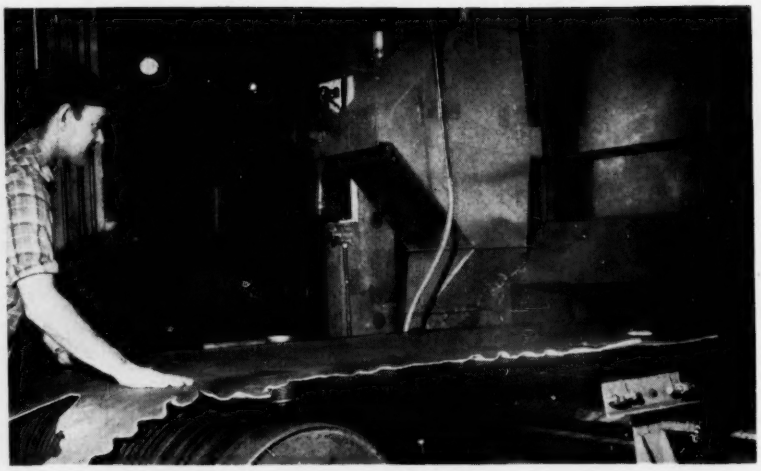
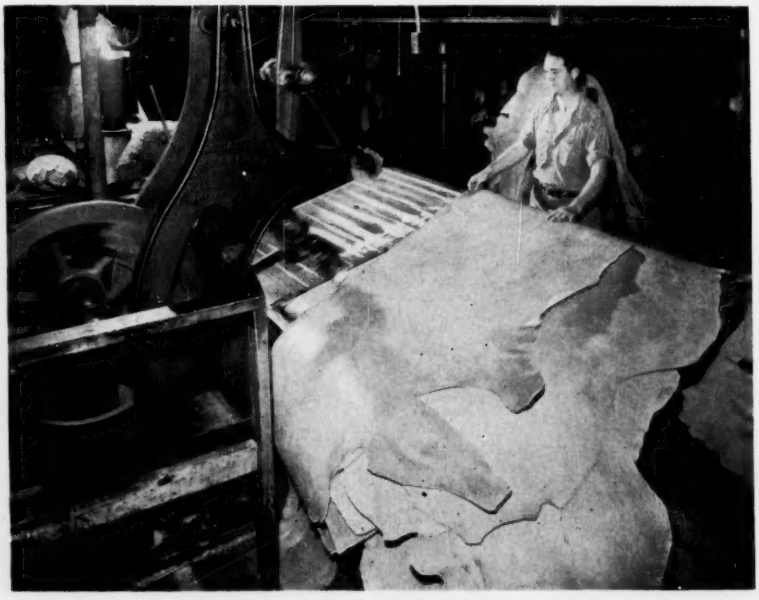


SPRAY-COATING of hides is controlled by magnetic-tape 'memory'.

also come in for its share of modernization. Wooden drums for hide washing, oiling and dyeing have been replaced by four 8x5-ft. Monel-lined steel drums polished to a mirror finish for protection of the leather's natural surface. Spray-coating of hides makes use of a highly automated system that detects the shape of conveyor-borne hides, registers the outline on a magnetic-tape "memory" system. The tape, in turn, controls four rotating spray guns, triggers them only when hides pass under them. The company is currently testing another electronic device to replace a slow mechanical digital system for calculating hide areas.

Tanning Unchanged: Though Lezin hasn't altered the basic tanning process, neither has he overlooked the possibility of making future improvements in that area. He was instrumental in hiring a chemist and building a laboratory to control and study the still-mysterious tanning chemistry. The chemist also produces the synthetic resin finishes that Salz



FINISHED LEATHER, glazed with clear casein, has natural look.

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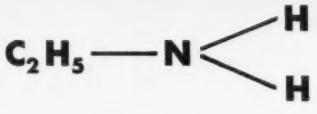
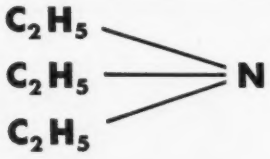


Its many uses include the production of amides, amine salts of sulfonates, modified urea formaldehyde resins and the preparation of salts where improved solubility is desired.

DIETHYLAMINE

Among its varied uses are: the manufacture of agricultural chemicals, emulsifiers, pharmaceuticals, amides, vulcanization accelerators, dyestuffs, surface-active agents.

TRIETHYLAMINE



Some uses: the isolation and purification of antibiotics; catalyst for phenolic resins; viscosity controller in enamels; acid accepting catalyst and solvent; intermediate for triethylammonium phosphate.

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uses on its lower-quality leather (about one-third of the company's $1.5-million annual sales is in so-called "splits").

Processing of hides from storage begins with a soak to remove residual salt, followed by lime and sodium sulfide baths to swell the leather and remove residual hairs. Soaked hides are then transferred to the actual tanning process, pass through two countercurrent systems in which they're subjected to the slow-acting tannins for a period of 40 days. This is the step that's still under pilot-plant investigation. To pass the test, reconstituted material will have to prove its ability to duplicate all the desirable properties of freshly extracted tannins—particularly the pleasing golden-brown color it assumes when oxidized. (Other tannins tend to turn pink or greenish gray on oxidizing.)

Other Angles: As Lezin sees it, a successful tannin extraction process would mean more than just the savings (estimated at about $92,000/year) the company would realize on bark shipping and storage. For one thing, he believes the operation could be tied in profitably to lumber mill operations. Salz would welcome an arrangement whereby it could purchase the bark—or the bark concentrate itself—from a lumber company.

It's still too early, says Lezin, to predict such factors as cost, minimum economic size, etc., of a commercial tannin extraction plant. However, the company isn't overlooking the possibility of becoming a basic tannin supplier. Judging from the inquiries it receives almost daily, and from the substantial demand for the bark in the Orient (even at prices somewhat higher than those of competing tannin materials), Salz believes there would be a ready market for all the tannin it could make in excess of its own requirements. Lezin is also seeking profitable uses for such by-products as spent tanbark to help share costs. The company has applied for a patent on a resin-bound, ground-leather floor tile that would make use of the more than 400,000 lbs./year of leather scrap from Santa Cruz.

Regardless of the company's success with the other projects, its bark extraction process is the key to lower tanning costs. And Salz is counting heavily on the pilot operation to open a process shortcut through the forest.

EQUIPMENT

Bag Flattener: Carrier Conveyor Corp. (Louisville, Ky.) offers a new bag flattener that operates on the principle of gently tossing bottom-heavy bags of loose, bulk material forward and upward along a vibrating trough. Material in the bags conveys more quickly than the bags, causes flattening to save storage space and make stacking easier. CCC claims fragile materials are flattened without product breakdown. Fixed and portable models of the bag flatteners are available.

•

Radioactive Markers: Where bright safety signals and markers are needed in areas lacking power for lighting, U.S. Radium Corp. (Morristown, N.J.) recommends its new Isolamp, which uses treated phosphor crystals excited to luminescence by Krypton^{85}. Light is visible at 500 yards. Offered in five colors, sources are enclosed in hermetically sealed, weatherproof, transparent capsules, have life expectancy of over 10 years.

•

Tank Lining: Du Pont's Fabrics Division (Wilmington, Del.) has come up with a new ready-cured tank-lining sheet that is said to give excellent over-all chemical resistance. Called Fairprene T-5594, it's made of synthetic rubber. Each sheet is 2-ply, 50 in. wide, ⅛ in. thick, is offered as part of a package including primers, adhesives and putty.

•

Process Controller: Quarie Controllers (Canton, Mass.) says its new Optimal Controller makes it possible to automatically maintain optimum performance conditions of a system or process regardless of changes of external conditions, because the controller combines many features of conventional process controllers with some of the logic devices of analog computers. The controller is set to maintain the best attainable value for a process (e.g., pounds of steam per pound of fuel) determined by selecting the proper slope for the operating curve of the process. Typical applications: optimum cost control of distillation column by balancing lost overheads against cost of steam used; obtaining optimum product in a catalytic reaction.

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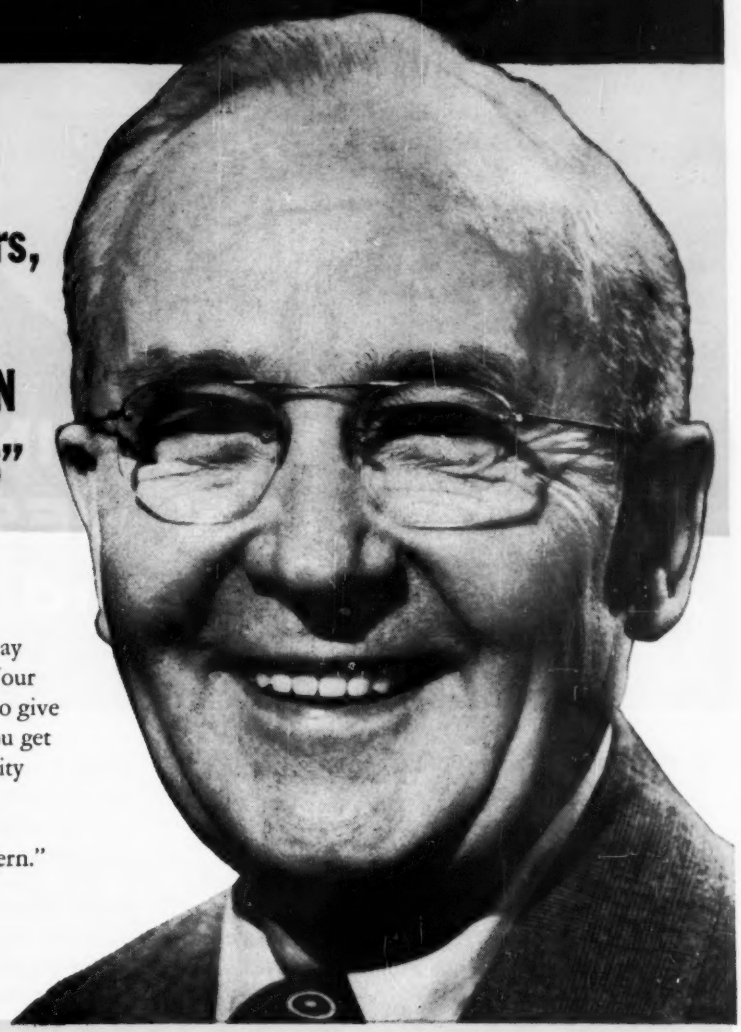

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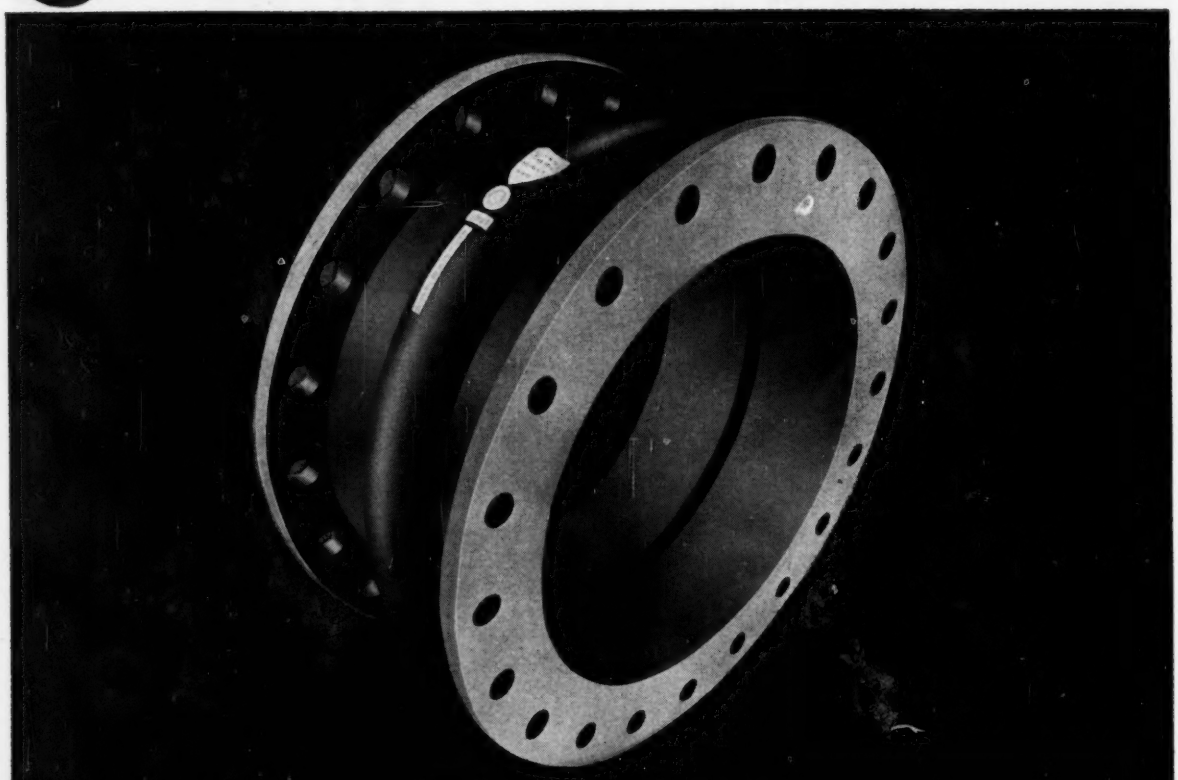

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Technology
Newsletter

CHEMICAL WEEK
January 12, 1957

Will Rilsan, the French nylon, get a footing in the U.S.? Rilsan Corp. (Boston) is right now negotiating with General Mills, which is reported to have taken a close look at the economics of making the fiber and is ready to start development as soon as it gets U.S. rights to the process. Neither party is talking about the deal.

Rilsan—nylon 11—is made from castor oil that is treated with methanol to form a crude methyl ricinoleate. This is pyrolyzed to the undecylenic ester, which may be treated with a hydrogen halide and then ammonia to form 11-aminoundecanoic acid—the Rilsan monomer.

A development of Pechiney in France, Rilsan is made there by Organico, a Pechiney subsidiary entirely devoted to the fiber. It manufactures the monomer in a plant in Marseilles, makes the fiber in a plant in Valence (in the Rhone Valley) and operates a plant in Normandy, which converts the monomer into forms suitable for non-textile applications.

Two other firms have obtained a license. One is Snia Viscosa in Italy, which buys Rilsan intermediate for fiber operations. A licensee in Brazil is putting up a plant that should soon be in operation.

Chief objection to the fiber here is cost of the raw material, castor oil. This presumably is not a big liability to General Mills with its strong position in vegetable oils.

And in other areas of the world, castor oil as a raw material would be highly desirable. For instance, there's interest in a Rilsan plant for Argentina, also for India. Organico itself is actively encouraging castor bean production in Africa.

•

Shut-down of AEC's small-scale homogeneous reactor at Oak Ridge, because of corrosion "difficulties," has put a damper on prospects of getting a large-scale power reactor of this type into operation by the target date that's been set by one prospective builder—Westinghouse wants to build such a reactor for Pennsylvania Power & Light Co. under AEC's power reactor demonstration program and figures to have it in operation in 1962.

But the betting now is that the project will be delayed until AEC scientists find some means of preventing the homogeneous reactor's highly corrosive fuel from causing stress corrosion cracks in the reactor tubing (where stainless steel is now used). Because the fuel is so highly radioactive, leaks in the fuel line are dangerous.

•

First word on a new cement process being developed by General American Transportation Co. emerged from a meeting of the New York Security Analysts last week. Sam Laud, chairman of the firm, revealed some of the work being done on the method (the Pyzel process).

If successful, says Laud, the process could have an impact on the cement industry comparable to the effect that cat cracking had on oil. The process has been moved to the pilot stage, and engineering for a large-scale installation is said to be "substantially complete." Patents on the process will be issued this week.

•

National Drug (Philadelphia) has developed a water solution of the enzyme trypsin. It has been available only in a heavy sesame oil. The new form, says National Drug, should make it easier to measure and inject, also eliminate the pain sometimes caused at the site of injection.

The difficulty in making non-oil solutions of a proteolytic (protein-digesting) enzyme such as trypsin is that it tends to digest most solutions, sets off a chain reaction in which it ends up digesting itself.

National Drug has side-stepped this by careful control of the acid content. It is supplying the product to physicians in two vials—one containing a dry powder, the other a diluent. In dry form, the enzyme is stable indefinitely. In liquid form, it can be kept for three months under refrigeration.

•

FDA will soon launch formal decertification proceedings against at least two of the four yellow coal-tar dyes (FD&C Yellows 1, 2, 3 and 4) now on the approved-for-use list. Only 3 and 4 are used extensively in foods, however,

The action has been under consideration for several months and FDA talked it over last summer with manufacturers and users of the dyes at a closed meeting.

•

Union Carbide is ready to grant licenses to instrument manufacturers for the manufacture of three Carbide-developed instruments: a chromatographic analyzer, a differential refractometer, and an electrolytic concentration cell.

The chromatographic analyzer, in particular, should stir up some interest in the instrument field. It incorporates a continuous sampler. Indicative of the importance of such an instrument: Perkin-Elmer now has ten prototypes of a similar instrument in the field.

•

Eli Lilly has gone off the avoirdupois system and has switched all its operations to the metric system. Lilly has asked all its suppliers to provide raw materials in metric units (including container markings and price invoices). The trend toward the metric system has been shaping up for some time in the fine chemical and pharmaceutical industries, but Lilly apparently is the first to go all the way.

The company admits that it is still too early to state how successful the move will be, but it reports a lot of enthusiasm for the idea among its suppliers.

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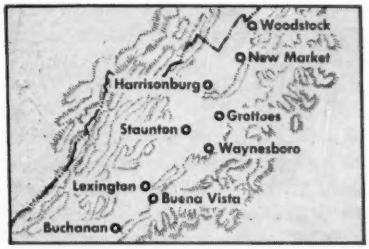

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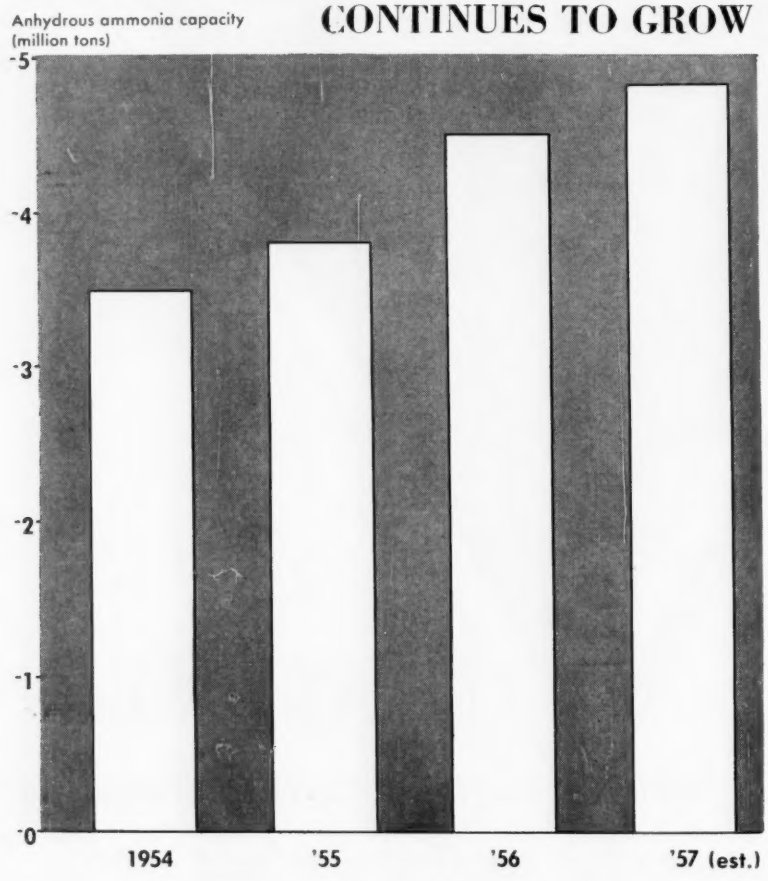
AMMONIA CAPACITY CONTINUES TO GROW



Where Will It All Go?

Next year, U.S. producers' continuing scramble for anhydrous ammonia outlets will be more frantic than ever. Why? Expansions during '57 will jack total U.S. capacity to nearly 5 million tons/year.

Compare that with today's 4.5 million tons/year capacity, which—significantly—turned out only 3.4 million tons in '56. That's a gap of more than 1 million tons/year between potential and actual output.

But the present glut won't be permanent—market analysts predict that within 3-4 years anhydrous ammonia demand will again be neck-and-neck with capacity.

Right now 47 plants (representing 33 companies) are producing anhydrous ammonia. During the next year, the total will increase *(see table, p. 66)* to 55 plants (41 firms). And all of next year's new facilities will be built by newcomers; only one company (Atlantic Refining) plans to expand its present plant. This influx of new producers is reminiscent of the major oil companies' rush several years ago to plunge into ammonia production.

Bright lure for current—and potential—ammonia makers is the anticipated, lush farm-fertilizer market. A good 76% of total production goes into fertilizer outlets, while about 24% is absorbed by various industrial uses.

This lopsided end-use pattern of ammonia consumption is one of the prime reasons for today's oversupplied ammonia market. The unstable farm situation of the past several months has knocked the props from under ammonia marketers.

A saving factor during '56, however, was the new high in fertilizer exports. U. S. foreign aid programs to Korea, India and other Far East nations have helped send plant nutrient shipments in '56 to $120 million, 33% higher than in '55.

Raising Hopes: Likely to raise hopes are a number of "nonfarm" fertilizer uses. One major company, Allied Chemical & Dye, has launched a strong promotional campaign to drive home the importance of using fertilizers in forestry, fishery and highway maintenance.

Although forest fertilizing is common in Europe, little has been done in this country. The U. S. Dept. of Agriculture has concluded after intensive investigation, however, that application of fertilizer by airplane will increase tree growth 40-65%. Since more than one-third of the nation's commercial forests are below par in productivity, ammonia manufacturers are taking a particularly aggressive approach in plans to exploit this potential outlet.

Marketers are also studying government reports on the fertilization of lakes and ponds. Results indicate that fertilization increases microscopic aquatic plant growth, which can add as much as 400% to the weight of fish. Since an average pond requires 800-1,200 lbs./year of fertilizer, some marketers feel that widespread application could significantly help to relieve the ammonia oversupply.

With the multimillion-dollar highway construction program going full blast, large amounts of fertilizers will be needed for landscaping and turf enrichment. Fertilizer application enhances the appearance of highways, but, more important, it decreases erosion and embankment damage caused by water runoff.

These three potential nonfarm markets for fertilizers, ammonia producers hope, will step up ammonia demand and keep it on a more even keel than it has been in the past.

Eye to Industry: And while the trade attempts to drum up business in laggard fertilizer outlets, producers

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U. S. Anhydrous Ammonia Producers

Company	Plant Location	Capacity (thousand short tons/year, est.) 1956	1957 additions
Ammonia Chemical	Huron, Calif.		40
Allied Chemical & Dye	Hopewell, Va.	390	
	La Platte, Neb.	75	
	South Point, O.	320	
American Cyanamid	Avondale, La.	60	
Atlantic Refining	Philadelphia, Pa.	36	27
Brea Chemicals	Brea, Calif.	110	
Columbia-Southern Chemical	Natrium, W. Va.	30	
Commercial Solvents	Sterlington, La.	135	
Calumet Nitrogen	Hammond, Ind.	110	
Cooperative Farm Chem. Assn.	Lawrence, Kan.	64	
Dow Chemical	Freeport, Tex.	90	
	Midland, Mich.	25	
	Pittsburg, Calif.	7	
Du Pont	Niagara Falls, N.Y.	10	
	Belle, W. Va.	230	
Escambia Chemicals	Pensacola, Fla.	70	
Food Machinery & Chemical	Charleston, W. Va.	22	
Grace Chemical	Memphis, Tenn.	87	
Gonzales Chem. Industries	Guanica, P.R.		40
Grand River Chemical (Deere)	Pryor, Okla.	65	
Hercules Powder	Pinole, Calif.	50	
	Louisiana, Mo.	42	
Hooker Electrochemical	Tacoma, Wash.	22	
Ketona Chemical	Ketona, Ala.	45	
Lion Oil	El Dorado, Ark.	210	
(Monsanto)	Luling, La.	120	
Mississippi Chemical	Yazoo City, Miss.	100	
Mississippi River Chemical	Selma, Mo.	72	
National Distillers	Tuscola, Ill.	60	
Northern Chemical Industries	Searsport, Me.	45	
Olin Mathieson	Lake Charles, La.	110	
	Morgantown, W. Va.	200	
	Niagara Falls, N.Y.	7	
Phillips Pacific Chemical	Pasco, Wash.	70	
Pennsalt Mfg.	Portland, Ore.	15	
	Wyandotte, Mich.	34	
Phillips Chemical	Etter, Tex.	215	
	Pasadena, Tex.	180	
Smith-Douglass Chemical	San Jacinto, Tex.	45	
Shell Chemical	Pittsburg, Calif.	115	
	Ventura, Calif.	65	
Standard Oil of California	Richmond, Calif.	105	
Standard Oil of Ohio	Lima, O.	108	
Spencer Chemical	Pittsburg, Kan.	185	
	West Henderson, Ky.	78	
	Vicksburg, Miss.	72	
Sun Oil	Marcus Hook, Pa.	108	
Southern Nitrogen	Savannah, Ga.		88
Southwest Agrochemical	Phoenix, Ariz.		21
St. Paul Ammonia Products	Pinebend, Minn.		70
Tennessee Valley Authority	Wilson Dam, Ala.	92	
Texas	Lockport, Ill.		63
U.S. Steel	Geneva, Utah		70
Rohm & Haas	Deer Park, Tex.		50
	Totals	4,506	469

are wrestling with the problem of boosting industrial application (now taking less than a quarter of all ammonia consumed). Industrial uses are mainly in fields (e.g., explosives, plastics, synthetic fibers) that are expanding.

- The chemical industry, which consumes a good 7% of total ammonia production, is growing and should increase its requirements in '57.
- During '56, explosives shipments tallied $190 million and some industry experts expect demand for explosives—spurred by growing requirements in mining and highway building—to increase at least 15% in the coming year.
- An estimated 3% of all ammonia produced is bought by the textile industry for synthetic fiber manufacture, and this percentage should increase in the next several years. One estimate: by 1960, man-made fibers may constitute one-third of all fibers consumed. Such a gain, translated to ammonia demand, might balance any loss incurred by further restricted fertilizer use.
- The consumption of plastics, especially by construction outlets, will have a direct bearing on the ammonia situation. Marketers feel that the present weakness in some plastics—polyethylene, for example—is temporary (*CW, Dec. 29, '56, p. 82*). Thus ammonia use should ride with a plastics surge.

Paper Market: Paper and pulp manufacturing today consumes about 1.5% of ammonia output; but it may be a "big time" future ammonia outlet. To aid in combating pollution, several mills are using an ammonium

End-Use Breakdown of U.S. Anhydrous Ammonia in 1957 (est.)

Fertilizers	**76.0%**
Chemicals	**7.0%**
Industrial explosives	**5.0%**
Synthetic fibers	**3.0%**
Plastics, resins, etc.	**3.0%**
Pulp and paper	**1.5%**
Metallurgy	**1.0%**
Petroleum refining	**1.0%**
Others	**2.5%**

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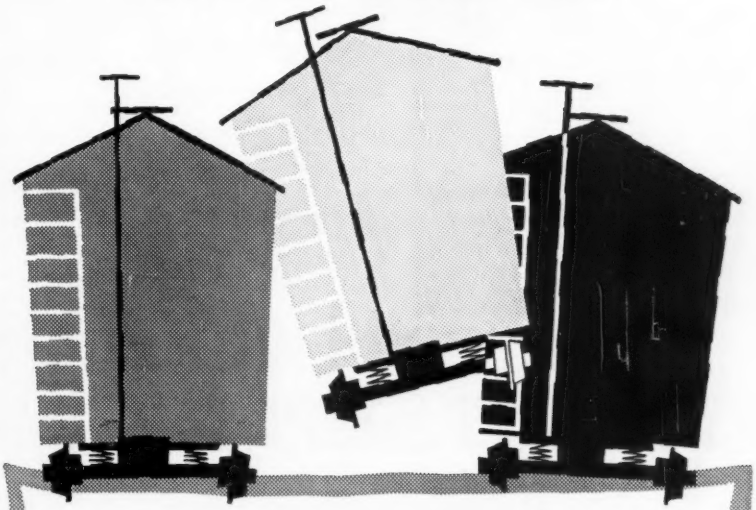

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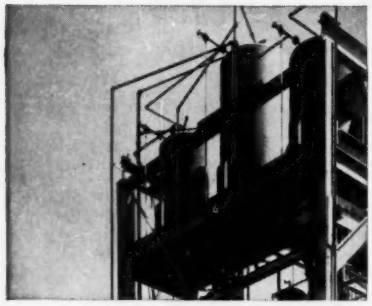

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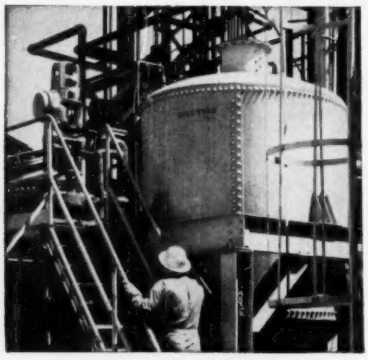

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instead of calcium salt for pulping. Ammonium bisulfite is said to result in better quality and efficiency. If this trend continues, use of ammonia in this outlet may increase considerably.

In all, industrial end-uses of anhydrous ammonia, though relatively small, are gaining momentum, but it cannot be denied that fertilizers are the mainstay of ammonia business. But as U. S. ammonia production capabilities continue to swell, marketers must find ways to absorb the excess. Nonfarm fertilizer uses and further industrial application of ammonia may well be the answers.

Plastics Score

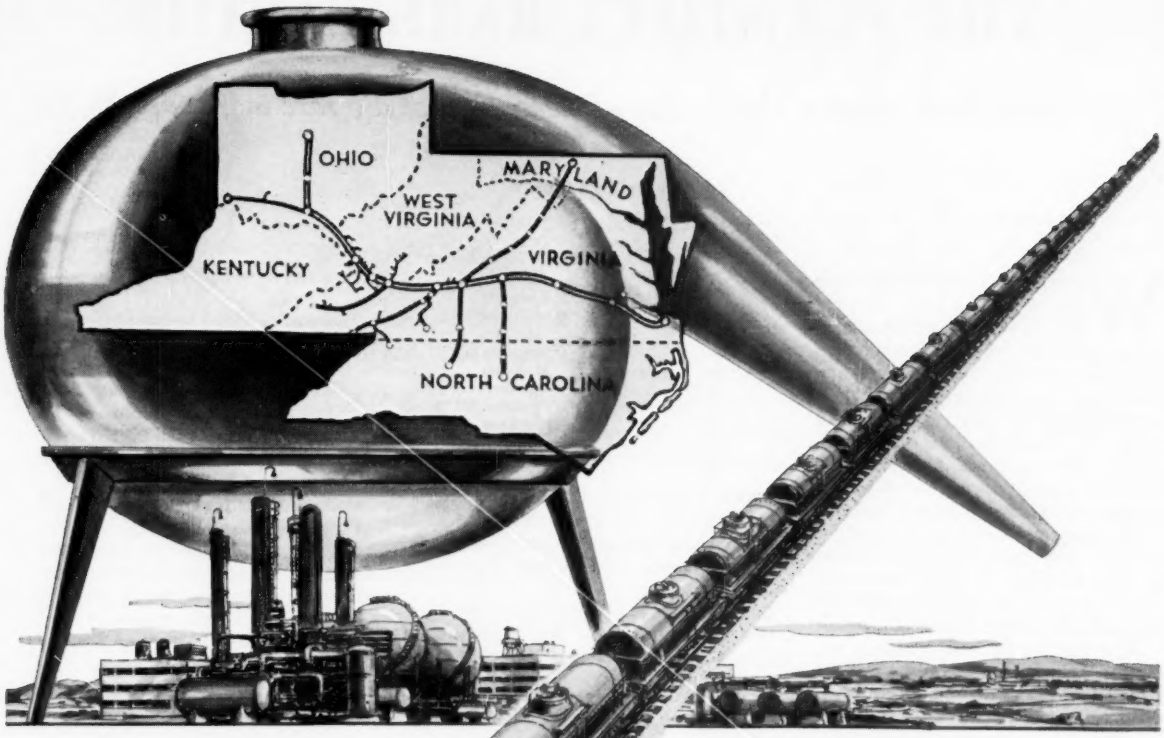
Last year was a good year for the plastics industry. Production climbed to more than 4 billion lbs., 10% above the '55 level; and, for the first time, total value of all plastics made exceeded $2 billion.

Here's how '56 output of each type of plastic compared with its '55 production, according to a year-end report by the Society of the Plastics Industry.

Production of polyethylene was over 541 million lbs., up 30% from '55; polyesters, 71.8 million lbs., up 30%; vinyls, 729.5 million lbs., up 10%; styrenes, 636 million lbs., up 4%; phenolics and other tar resins, 503 million lbs., about the same as in '55; ureas and melamines, 312 million lbs., also close to the '55 output; cellulosics, 140 million lbs., down about 10%.

Monthly compilations of sales statistics by SPI reveal that both molders and extruders last year enjoyed an approximately 6% increase in business (over '55). But while molding of thermosetting plastics increased an estimated 10%, thermoplastic molding fell off slightly. Planned expansions by molders are generally on the low side—most indicate no more than 10% increase of capacity. Makers of reinforced plastics products plan greater boosts of production capacities—in one case as much as 250%. Extruders, too, are scheduling sizable expansions.

What's ahead in '57? Total U.S. capacity, says SPI, will probably increase about 5%; production will continue at full capacity. Plastics output this year should increase to an estimated 4.3 billion lbs., or 5% higher than the '56 level.



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Add to these advantages this progressive area's strategic location in relation to major U. S. markets and the big Port of Norfolk on famed Hampton Roads . . . where materials or finished products can be exported or imported with top efficiency.

Consider, too, that this territory's rail transportation requirements are dependably fulfilled by one of the nation's leading carriers — the Norfolk and Western Railway — and we think you'll understand why the Land of Plenty provides a "background and backbone for chemical plant efficiency."

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Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western Railway

THE PLENTIFUL RARE EARTHS

some facts about a clubby clan of elements that are rare in name only

a report by LINDSAY

We got to thinking the other day that perhaps a lot of industry folks are passing up a diamond-studded opportunity because they believe the rare earths are unavailable in commercial tonnages. Nothing could be farther from the truth. Rare earths are *not* rare! Commercial salts of the rare earths are available, right now, for prompt shipment in quantities from a gram to a carload.

That the rare earths are so plentiful is due, in large part, to Lindsay. During the last 50 years, Lindsay has developed the extraction and separation of rare earths to a high degree.

New equipment and processes are now in operation at Lindsay's West Chicago plant and are producing greater quantities of these versatile materials in higher purities than before.

FROM 57 THROUGH 71—Some chemists call rare earths Lanthanides, Lanthanons or the Lanthanum Series. Actually they are not earths, but trivalent metals, a rather amazing family of elements . . . atomic numbers 57 through 71. They are grouped together because they are always found together, with thorium and yttrium, in ores such as monazite, and all have closely related properties. While rare earths are technically metals, Lindsay produces them in chemical salt forms—individually or in combinations.

ATOMIC NUMBER	ELEMENT
39	Yttrium
57	Lanthanum
58	Cerium
59	Praseodymium
60	Neodymium
62	Samarium
63	Europium
64	Gadolinium
65	Terbium
66	Dysprosium
67	Holmium
68	Erbium
69	Thulium
70	Ytterbium
71	Lutetium
90	Thorium

SOME USES FOR RARE EARTHS

LANTHANUM—As lanthanum oxide in a high refractive optical glass, particularly for aerial cameras and other instruments.

CERIUM—Glass polishing. Scavenger in explosives production. Radiation protection glass for atomic reactors. Opacifier for porcelain. Oxidizing catalysts in organic preparations. Ultraviolet light absorber.

MIXED RARE EARTHS—Misch metal for lighter flints and alloy uses. Motion sickness medication. Cores of arc carbon electrodes. Aluminum and magnesium alloys.

PRAESODYMIUM & NEODYMIUM—Dichroic colorants for ceramic glazes and glass. Used in better grade sun glasses. They do not lower light permeability and index of refraction when used as colorant or decolorizer. Ceramic capacitors.

The rare earths are becoming increasingly important in the production of steel and steel alloys. Small quantities added to the metal in the ladle result in a strong, fine-grained steel. Steel thus treated has great resistance to low temperature oxidation and corrosion. Stainless varieties have better hot and cold workability. Silicon and electrical grade steels have better electrical qualities.

Rare earths added to cast iron act as powerful deoxidizers and help remove sulfur from the molten metal. They are responsible for cast iron that is resistant to scaling at higher temperatures and to certain corrosive atmospheres. In malleable metals, they act as a carbide stabilizer.

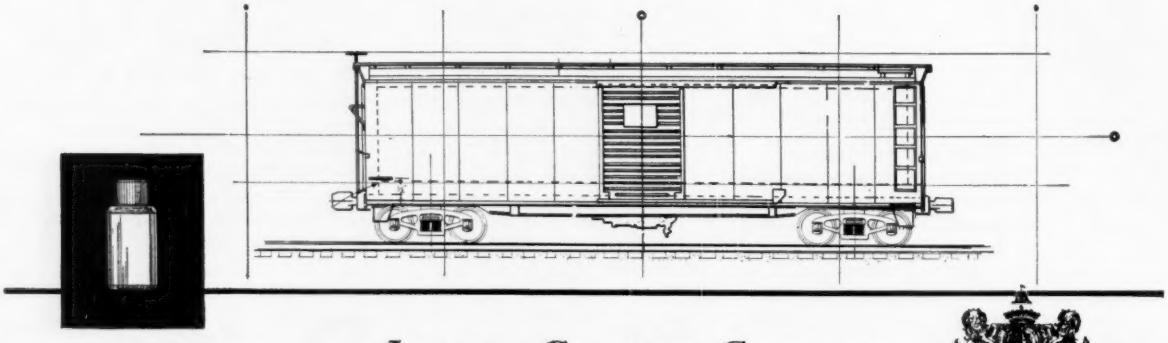
Magnesium-rare earth-zirconium alloys have excellent casting qualities and mechanical properties that make them ideal for important light-weight stressed components of aircraft engines.

Other rare earth compounds are used extensively for waterproofing, mildewproofing, weighting and dyeing of fabrics and compounding printing inks and phosphors.

LIKE AN ICEBERG—You might compare uses for the rare earths to an iceberg. What you see is only a small part of what lies undiscovered under the surface. In all probability, there is a real place for one or more of the rare earths in your operations. New uses—and profitable ones, too—are being discovered constantly. These versatile elements offer so much promise in so many different ways they merit your investigation.

To industries interested in the rare earths, we offer detailed technological data compiled over the years by our research staff. We will also furnish samples for experimentation.

And please remember . . . the rare earths are *plentiful*. Lindsay can supply you with quantities from a gram to a carload.



PLEASE ADDRESS INQUIRIES TO LINDSAY CHEMICAL COMPANY

270 ANN STREET • WEST CHICAGO, ILL.

Market Newsletter

CHEMICAL WEEK
January 12, 1957

Contrary to reports published this week, 1956 output of elemental sulfur in the U. S. ran close to 7 million long tons. Reason for the confusion: the reported data—just released by the Business and Defense Services Administration—is already subject to revision, according to a BDSA spokesman.

1956 production of Frasch sulfur is now estimated at 6.4-6.5 million long tons—as much as 200,000 tons more than first reported; it indicates a boost of 7-800,000 tons over the '55 output.

Production of recovered sulfur, too, will probably tally somewhat higher than first anticipated, will amount to at least 480,000—perhaps 500,000—long tons.

By comparison, total '56 sulfur output—including elemental material and sulfur from all other sources—amounted to about 7,875,000 long tons (*CW Market Newsletter, Dec. 29, '56*).

•

Competition for world sulfur markets increased markedly in '56, according to the BDSA report. Mexican producers, for example, made further inroads into U. S. markets. Total U. S. sulfur imports increased a big 400% in '56, to a new high of 180,000 long tons.

The foreign competition has consequently cut into the expanding domestic market and has upped U. S. producers' stocks to the highest levels since prior to the Korean conflict.

But despite the heavier world-wide competition, exports of U. S.-produced sulfur, in '56, were at about the same level as in preceding years —approximately 1.6 million tons.

•

Sulfuric acid production and consumption continued to expand during recent months because of increasing use for steel pickling, chemicals, coke-oven ammonium sulfate, pigments. Too, gains in the output of phosphatic fertilizers have helped keep sulfuric consumption at high levels.

•

Latest addition to the long and expanding list of completed ammonia plants (*see p. 64*) is U.S. Steel's unit at Geneva, Utah. Capacity: 70,000 tons/yr. of anhydrous ammonia, 68,000 tons/yr. of prilled ammonium nitrate.

Prices quoted, f.o.b. Geneva: ammonia, $88/net ton; ammonium nitrate, $70/net ton in 80-lb. bags and $66/net ton in bulk.

•

Outlets ranging from guided missiles to paints are potential markets for unsymmetrical dimethylhydrazine, which has just gone into production at Olin Mathieson's plant at Lake Charles, La.

Dimethylhydrazine—a strong reducing agent—is useful as an aviation fuel, oxygen scavenger, anti-skinning agent in paints; it's available in 30- and 50-gallon drums. This and related products (hydrazine hydrate, anhydrous hydrazine, other hydrazine derivatives) are marketed through the firm's Industrial Chemicals Division and through its High Energy Fuels Operation (which handles sales of compounds for use as missile and aircraft fuels).

•

Commercial-scale production of nonyl alcohol is underway at Eastman Chemical's Kingsport (Tenn.) plant. Dinonyl phthalate as well as the 9-carbon alcohol is being made there, and both are forerunners of several derivatives of higher aliphatic aldehydes that the firm plans to offer in the near future. Principal potential market for nonyl alcohol: plasticizer manufacture.

•

General Electric will boost irradiated polyethylene (Irrathene) production this month from 300,000 lbs./year to 1.6 million lbs./yr.—a 435% increase. The facilities (at Pittsfield, Mass.) will readily permit further expansion in the future.

Reason for the current production increase: '57 sales of the product—used primarily in electrical insulation—are expected to be double the volume sold last year.

•

Slab zinc consumption this year, says American Zinc Institute, may well exceed the record set in '55 when consumption climbed to well over a million tons.

Meanwhile, '56 went down as the second best year so far with an estimated zinc slab consumption of about 992,000 tons. Breakdown of '56 slab uses: galvanizing, 429,000 tons; die casting, 359,000; brass mills, 121,000; rolled zinc, 47,000; other uses (including higher-grade zinc oxide), about 36,000 tons.

Confidence in '57 zinc prospects is based partly on the growing demands for zinc in die casting, galvanizing of steel, and in brass, rubber, and paint-making. The average '57 car, for example, carries more than 65 lbs. of zinc, compared with 60 lbs./car used in '56 models.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending January 7, 1957

DOWN

	Change	New Price
Potassium stannate, dms., frt. alld. E., lbs.	$ 0.004	$ 0.705
Sodium stannate, dms., wks., frt. alld. E., lbs.	0.005	0.575

All prices per pound unless quantity is stated.

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Management studies customer reactions in limited markets to foretell a product's national acceptance.

Test-Tube City Reduces Marketing Risk

In the past few weeks, Lever Brothers has taken a low-sudsing powdered detergent off the market and replaced it with a liquid low-suds detergent. Yet the whole operation, rather than being a costly and consumer-ruffling grand maneuver, looked more like a move in a calm game of chess. Because both products—the now-discontinued dry Vim and the newer liquid Hum—have been sold only in test markets.* Lever, by closely observing their performance in these carefully chosen, geographically limited fields of action, has learned enough to make its decision—a decision based on information far more sound than that provided by a simple consumer survey and obtained at far less risk than that from a full-scale national marketing attempt. Lever, like many other specialty makers, finds test marketing the best way to learn the public's reaction to a product.

Many firms consider test marketing the most important part of market data gathering.

Says Toni Co. (Chicago) "If census sources and surveys really reflected the market situation, there'd be no need for test marketing. But they don't; the public is unpredictable, and test markets are a must."

As an Eastern cosmetic maker puts it: "You never really know what a consumer will buy until you sell it to him."

Pretty Average: If you're considering trying a test-marketing program, here are some things to remember. A test market is of little use in planning over-all sales strategy unless two things are true: The market must be typical of the total market you're after. It must be possible to obtain an accurate picture of what happens to a product there.

As a result, most companies prefer a middle-size test-market city, since costs of getting adequate distribution, advertising coverage and of checking results in such large cities as Chicago, New York or Philadelphia are prohibitive. Others, however, maintain that these important markets may be so different from the average city that they must be tested before a company can really have any idea of what a product will do.

Other factors besides size are important, if a city is to be a good test area. Procter & Gamble cites these:

- There must be enough newspapers and television and radio stations to approximate, on a limited scale, the effects of national advertising.
- The test city should have no qualities known to be peculiar to it alone, qualities such as buying habits, marketing history, etc., that would bias the projectability of test market results to a national basis.
- Retail stores of various types and sizes must be sufficient in number to provide an approximation of national retail conditions.
- The city must be isolated enough that accurate records of product shipments into the market will further indicate results, and that consumers aren't affected by advertising and marketing in nearby cities.

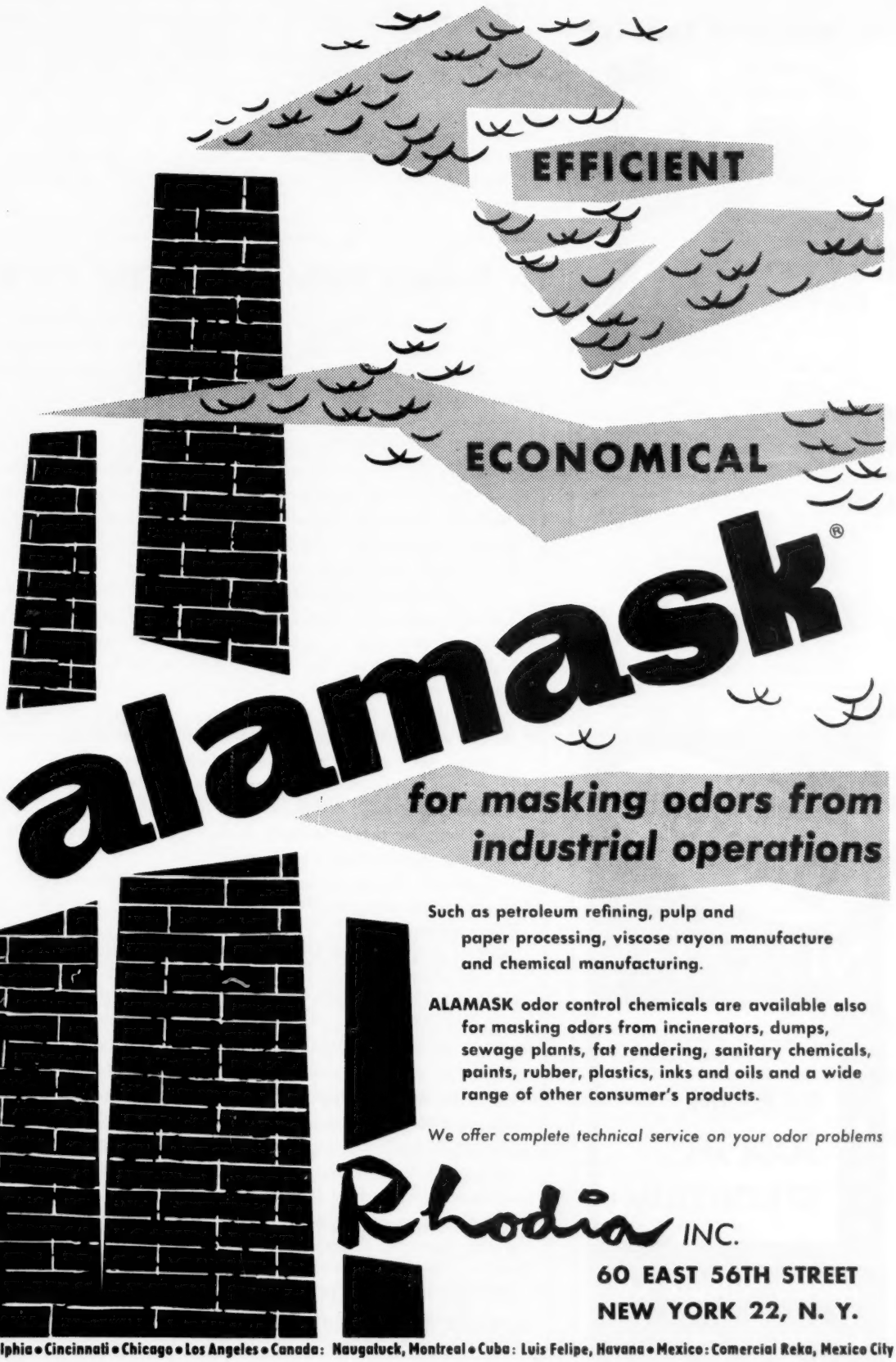
In addition, it's important that retailers be cooperative in checking sales. A city in which A&P stores dominate the supermarket picture, for example, would be a bad test market. Reason: some large chains, including A&P, seldom welcome untried products into their stores, usually will not cooperate with test marketers.

Jaded Jurors: The cities in the U.S. that best fit test-market qualifications have been used repeatedly. Most frequent choices: Peoria, Ill.; Hartford, Conn.; Spokane, Wash.; Syracuse, N.Y. Also popular with marketers: Springfield, Mass.; Louisville, Ky.; Atlanta, Ga.; Toledo, O.; Providence, R.I.; Portland, Me.; Grand Rapids, Mich.; Columbus, O. Last year, St. Louis was most popular.

But there's a trend away from testing in these often-used cities. With too many new products being introduced in one city you get what a Bristol-Myers marketing man calls "too much circus"—nobody's product will make a real impression.

Checkup: To learn how well a new product is moving, it's possible just to

*Vim has been sold in Detroit and Cleveland for the past two years. Hum was introduced this fall in Columbus, O.



Such as petroleum refining, pulp and paper processing, viscose rayon manufacture and chemical manufacturing.

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tally up the number of bottles or cans disposed of—but this doesn't indicate how much is utilized in merely filling distribution channels. For a quick count of actual over-the-counter sales, it's usually necessary to conduct a store audit (i.e., actually counting the number of the packages in a store, and subtracting this total from that of deliveries). To do this work, specialists like Selling Research, Inc. (New York), Burgoyne Grocery & Drug Index (Cincinnati) and A. C. Nielson Co. (New York) are available. (Side-

SMALL FIRMS CAN TEST TOO

You don't have to be the size of Lever Bros., Sherwin-Williams or Johnson Wax to test-market a product. One West Coast specialty manufacturer, with distribution only west of the Rockies, feels it can make useful tests without spending over $5,000. Its usual test campaign costs $2,000-$2,500.

E-Z-Est Products Co. (Oakland, Calif.) which makes silver polish, copper polish, an oven cleaner, and other household products, finds that close knowledge of its customers makes up for lack of money. It knows that its products sell best in areas of higher-than-average income where fastidious housekeepers are more likely to have a little extra money to play around with.

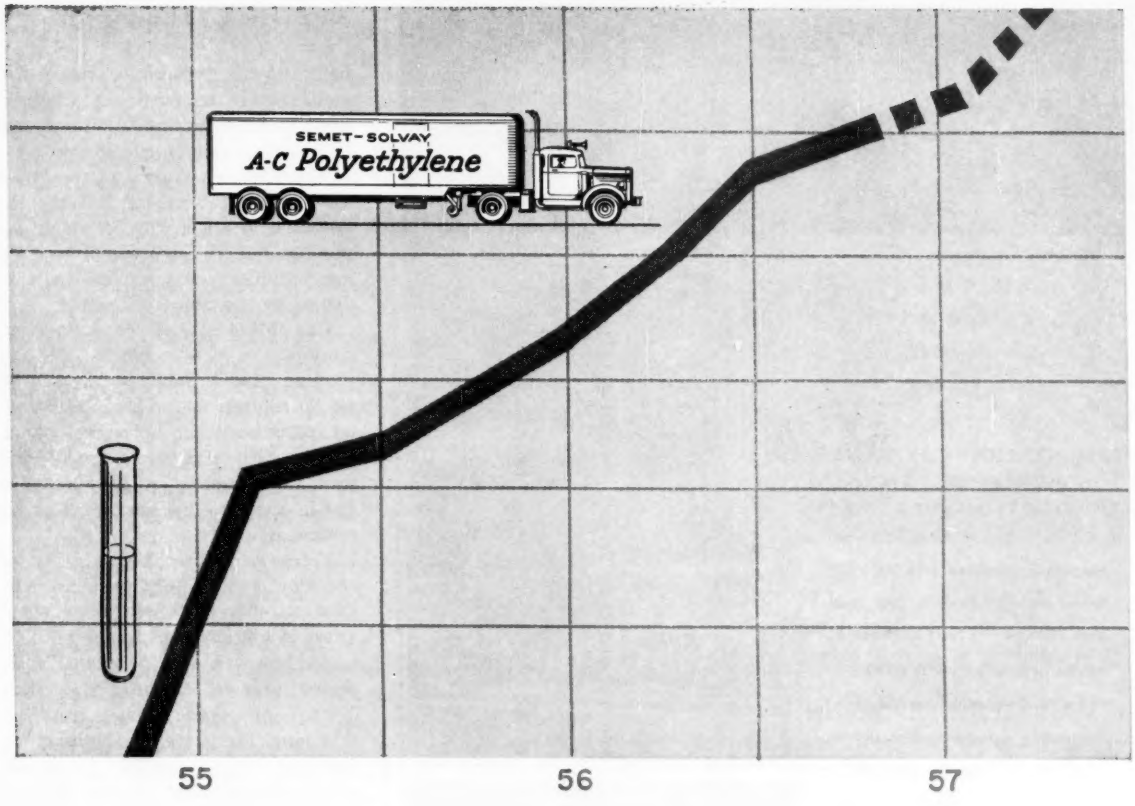
E-Z-Est's favorite test cities are Stockton (77,000), Santa Rosa (20,000), and Palo Alto (41,000). The latter, a university and commuter town, has a high percentage of professional and other high-income families. (One city—Los Gatos, Calif.—was vetoed for test-market purposes by E-Z-Est's president, Arnold Sampson. In touring the city, he saw too many new houses with two cars for the city's average income level. Thus, he felt that people there had to watch their money too closely in the supermarket.)

The company likes to hit a test market as hard as it can, using the most aggressive merchants and spending as much as it can afford on advertising. It can't force a market, however; it's too small and doesn't have enough money.

Generally, the firm starts off with a fairly low volume of advertising and depends on merchant and word-of-mouth promotion. But if acceptance is slow, E-Z-Est will boost promotion spending to as much as 20% of the wholesale cost of the product put into the area. So far, advertising money has gone only into TV and daily and neighborhood newspapers, but Sampson is planning to try to reach commuters through their car radios.

Lack of money also prevents use of professionals to survey results. The company's own salesmen are sent out to query neighborhoods, find out things like the proportion of families that own copper or silverware, pass out miniature samples. One man can call on 100 families or so in a couple of days. Also used are trade journals—to find out what competition is doing—as well as census information on income levels.

Most important, however, is management's judgment in interpreting surveys, observing conditions, and in evaluating actual orders. After all, whether the company is big or small, the main thing test marketing provides is something for management to think about.



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Test tube to truck load quantities in 23 months is the sales record of A-C POLYETHYLENE in the polish field!

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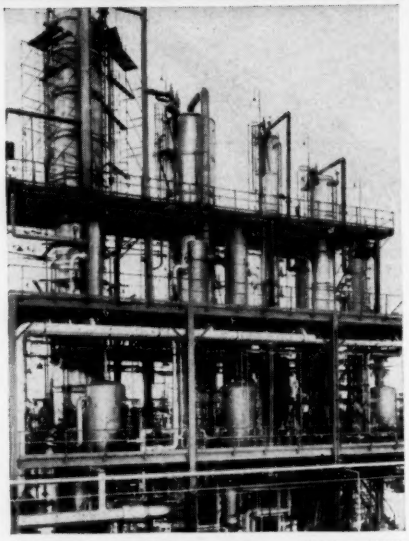

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light: it's not unusual for, say, a cosmetic maker to have one of these firms audit a market test conducted by a competing cosmetic company.)

The opinion survey is another often used checking method. In this, the consumer is asked why he bought the product. Others make use of continuing consumer panels, such as that conducted by the Chicago *Tribune*.

One Midwest hair products company uses its own people for checking purposes, moves in a special crew to set up controls and audits, follows up on purchasers and interviews them. The crew is pulled out for a while and then brought back for further audits and interviews—this time to check on repurchases.

Turnover Time: The necessity of checking repurchases explains why most test-market experts recommend a test of not less than 6 months. This varies, however, with the product's expected turnover. A slow-moving item like furniture polish requires considerably more than a year of testing, for instance, while washday detergents, with a fast turnover, can get by with 3 or 4 months. One sales manager told *CW* he thought any new package should prove out in about 2 months, any new product in from 4 to 12. On the other hand, some products move too slowly to make testing at all feasible.

Other things can influence the duration of a test-marketing program. One firm may prolong a test if he believes competitive or other conditions have not been normal. Another may linger in a test market with a slow-to-take-hold product while trying to doctor it into life.

Because of novelty appeal, slam-bang promotion, or sales force enthusiasm, a new product will generally rack up good initial sales. After this first spurt, it will then begin to drift back towards its real level of acceptance. And it's this level that manufacturers want to gauge.

Competitor Connivance: In the highly competitive chemical specialty fields, rivals delight in confusing each others' test-market data. One fouling device: Company A goes into a Company B test market and promotes its own competitive products—on a scale it could never duplicate nationally. One firm's toothpaste test was messed up by a competitor who came in with large free samples, killing the demand

for tooth paste for weeks. Extra-rich premium coupons have also been used to cloud results of test marketing. Some companies have gone so far as to enter a competitor's test market with a hurriedly devised copy of the new product.

Obviously, then, most would prefer to keep their test marketing secret. But almost all agree that it's futile. Companies—especially the large ones—have pipelines of information flowing continually from salesmen. Says one Midwest polish maker: "If we want to keep a secret, we don't even test-market, but just launch a product on our own judgment. We usually have the news the day after the competition introduces an item."

All the Same: It's usually a mistake to expect a product that captures 6% of the test-market business to capture 6% of the national market. The best that can probably be hoped for: national results falling within 1 or 2% of a prediction. General business conditions might change between test marketing and national marketing; there might be greater competition by the time the product is given national distribution; the level of distribution will probably be different, etc.

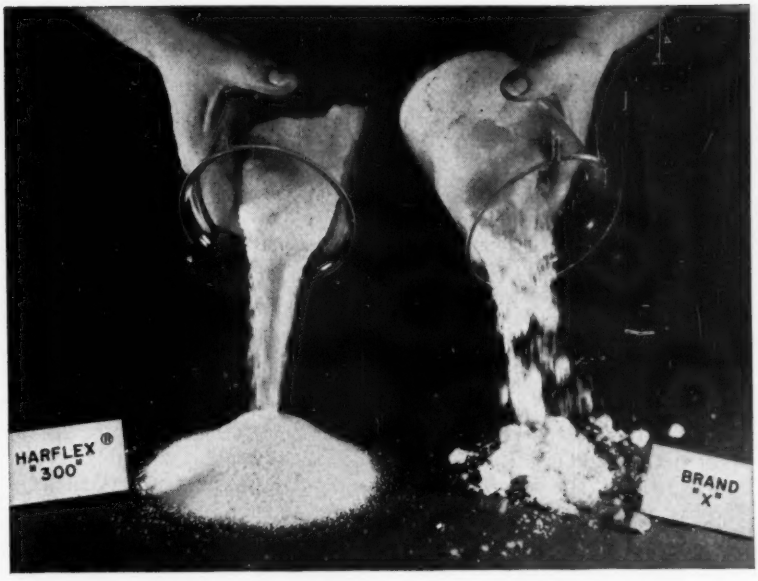
On statistical procedures, all that one executive of Selling Research, Inc., is willing to say is that "a test market in Peoria will give you some idea of how you are going to do in Peoria."

Most companies agree that from test marketing one can usually get:

- A yes or no on the question of consumer acceptance of a product.
- Some idea of how to alter a product or marketing strategy.

Usually it's marketing plans that are changed at this stage; product bugs supposedly have been removed in the lab. However, the start of volume production always brings problems that have to be ironed out in the test market. The experience of Charles Rolley Co. (San Francisco) isn't unusual. Rolley, while test-marketing its Sea and Ski suntan product, had to solve problems of the product separating and thickening while on dealers' shelves. Similarly, Bristol-Myers had to iron out a number of mechanical problems in test markets while developing its successful "ball-point dispenser" for Ban antiperspirant.

How Much? Test marketing costs money—enough so that few small or



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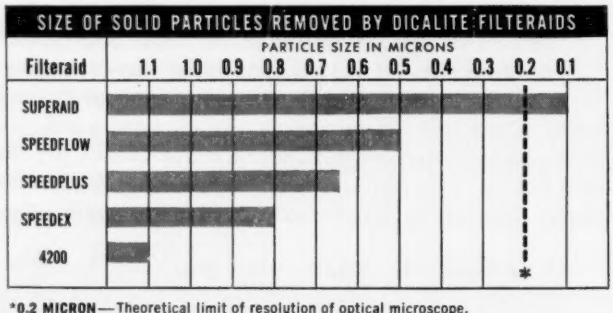
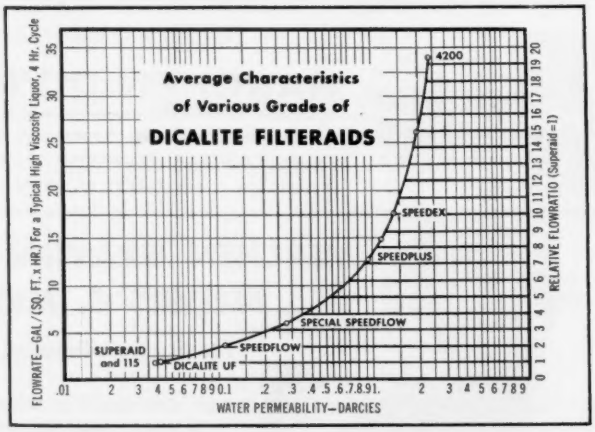


*0.2 MICRON—Theoretical limit of resolution of optical microscope. Few microscopes achieve it.
80.0 MICRONS—Smallest particle size visible to the unaided eye at 10" distance.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SPEEDPLUS
SPECIAL SPEEDFLOW
SPEEDFLOW
SUPERAID and 115
DICALITE UF
FLOWRATE—GAL./(SQ. FT. x HR.) For a Typical High Viscosity Liquor, 4 Hr. Cycle
RELATIVE FLOWRATIO (Superaid=1)
WATER PERMEABILITY—DARCIES
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new companies can do it in a very big way. Seldom, too, do they have sufficient depth in management to properly use the data (*for a dissent, see p. 76*). One polish maker estimates that, not counting promotion costs, a four-market test lasting 6 months with before-and-after store audits should cost about $25,000. A cosmetics house, figuring in all expenses, claims "$100,000 or less—usually less—is about all you dare gamble." Rolley, now test-marketing a new hair preparation, says you should gamble at least $50,000, would itself be content to lose that much this year on the product if public acceptance seems good.

A Midwestern hair products maker sums it up this way: "Sound test marketing is by no means inexpensive, but it can be the cheapest way to spend money in the long haul. You can learn how to market the product successfully if it's good, and you can save a fortune by stopping work on it if it's a dud."

Push for a Polymer

Klear, a polymer-based floor polish —with a composition that represents "the first basic formulation change since the introduction of self-polishing wax," according to its maker, S. C. Johnson & Son—is being introduced in New England markets this week.

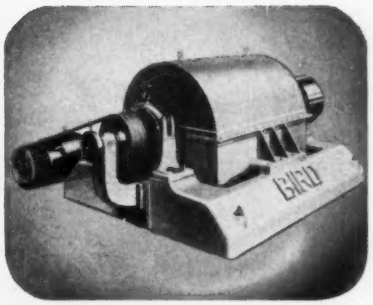
All ingredients of Klear, except for the water base, are new to self-polishing waxes, Johnson reports. The combination produces a film said to be clear, nonyellowing, and far more resistant to water spotting than present resin polish films based on shellac. Basic new ingredient, trademarked Plexon, is an unidentified synthetic resin, is reputedly a styrene-based polymer.

This material and the other components are apparently cheaper to work with than waxes—Klear's price is slightly lower than those of other Johnson self-polishing waxes. Pints and quarts of Klear (packed in round, dripless-spout cans) sell for $.65 and $1.10; half-gallons and gallons, in rectangular cans, retail for $1.89 and $3.49.

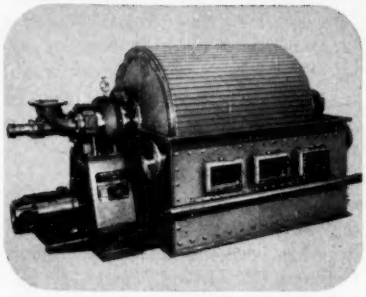
The product is now being sold in the Northeast only. Johnson terms this a regional introduction rather than a test market, citing lack of manufacturing capacity as the reason for not "going national" immediately.

Here's Why You're Most Likely To Find The RIGHT FILTER Right At BIRD

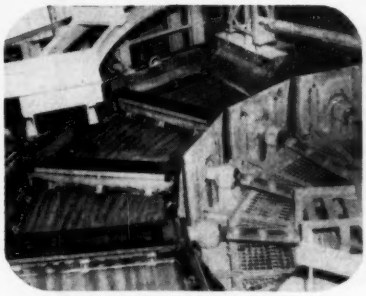
Only at Bird will you find *all* the different types of separation equipment shown here — your assurance of *unbiased* recommendations, backed whenever you wish with comprehensive, comparative test findings from the Bird Research and Development Center.



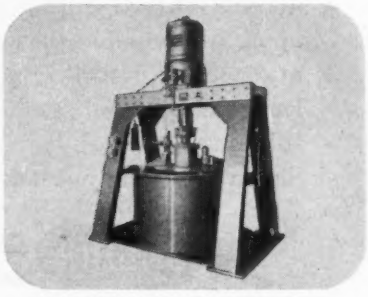
BIRD CONTINUOUS CENTRIFUGAL FILTERS for thorough dewatering of large or small volumes of slurries, thick or thin, hot or cold; solids coarse or fine.



BIRD-YOUNG VACUUM FILTERS are continuous, rotary, drum type filters designed for high capacity per foot of filter area, complete washing and dewatering and complete discharge of filter cake even when exceedingly thin.



BIRD-PRAYON VACUUM FILTERS are horizontal, tilting pan filters designed for continuously efficient removal of solids and thorough multistage wash without dilution of mother liquor. Filter areas from 27 to 516 sq. ft.



BIRD SUSPENDED CENTRIFUGALS are heavy duty, high capacity batch centrifuges with 26″, 40″ or 48″ perforate or imperforate baskets. Fume-tight or explosion proof construction, if needed.

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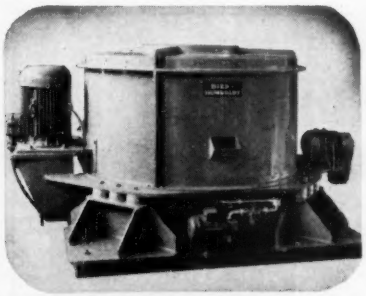
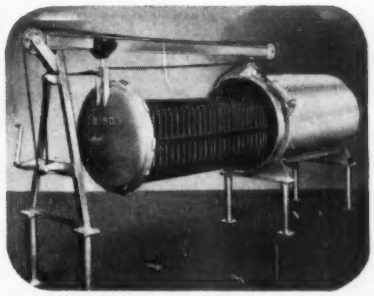


BIRD-HUMBOLDT CENTRIFUGAL DRYERS combine screen oscillation with centrifugal force for dewatering coarse or granular solids. They provide continuous flow, high capacity, low power consumption and long screen life.



BIRD PRESSURE FILTERS are horizontal tank, vertical leaf filters for large volume, low cost liquid clarifications. Filter areas from 10 to over 1500 sq. ft.

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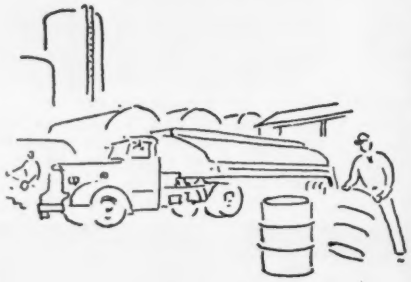

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PRODUCTS

Color Restorer: A combination fabric and rug cleaner and color restorer, Clean-Tint, is being produced by the Clean-Tint Corp. (Los Angeles). Material is applied with sponge, is said to be unaffected by dry-cleaning agents. Twelve colors are available. Price: $2.95 for a pint-size glass container.

•

Water Softener: Arizona Minerals Corp. (Yuma, Ariz.) is offering Aridzone Blu-22, a new sodium aluminosilicate ion-exchange material with a rated capacity of 22,000 grains exchange per cubic foot. Its price is said to be pegged at two-thirds that of other high-capacity exchange materials.

•

Marking Ink: A high-opacity marking ink that uses pigments instead of dyes has been introduced by Organic Products Co. (Irving, Tex.). The ink, called F-150, is made in white, black, blue, red, green, yellow and orange colors. Markings with the new ink are said not to be affected or removed by vapor degreasing or by immersion in water, oil, greases or naphtha.

•

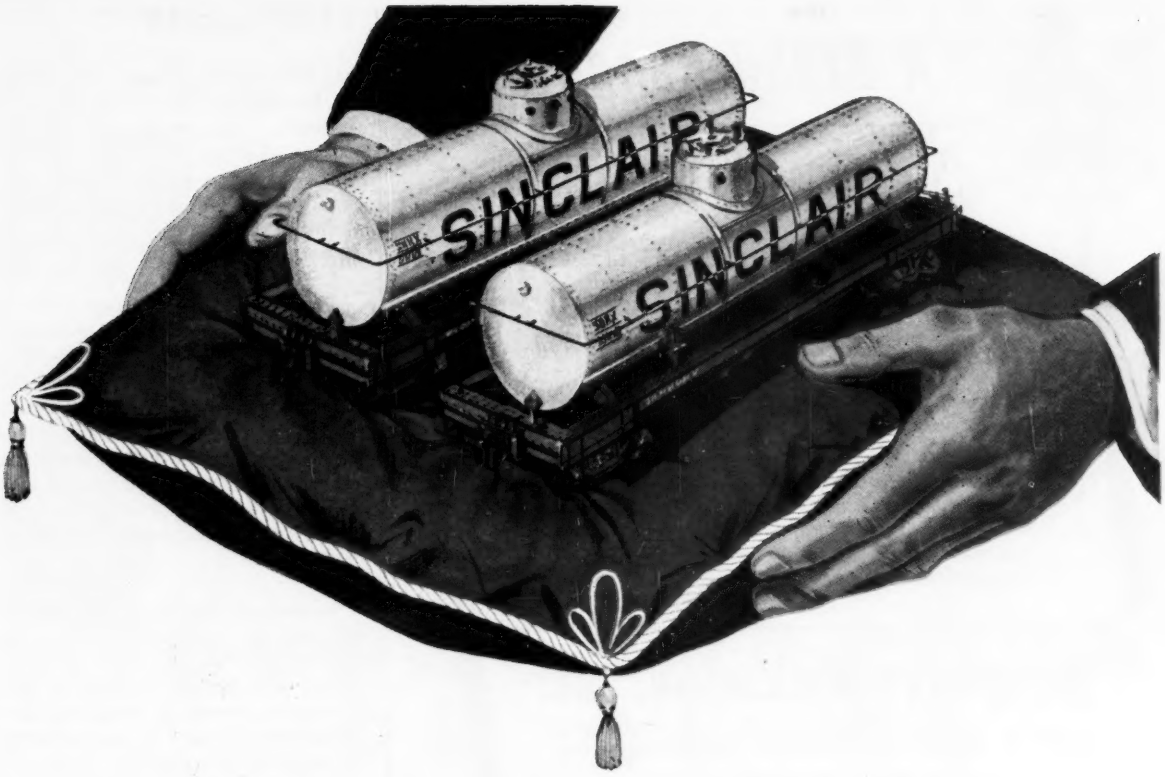
Rust-Spot Remover: A Danish product imported by Fred Pedersen (Berrien Springs, Mich.) is said to be able to remove long-standing rust stains from fabrics (except rayon), porcelain and metal. A 3-oz. collapsible tube sells for 79¢. It's name: Magica.

•

Dip Coatings: Metal & Thermit Corp. (Rahway, N.J.) has just introduced four dip compounds to be used as finish coatings in zinc- and cadmium-plating operations. Dip 1085, a leachless, chromate-type dip, gives bright, clear coating to zinc plate. Compound 1090, furnished as liquid concentrate, is similar to the dry 1085. Dip 1084 is for cadmium-plated parts. When used in low concentrations, it is said to be well suited for finishing thin plated bulk work. Dip 99 is a liquid version of 1084.

•

Contact Cement: Borden Co.'s Chemical Division has just developed a fire- and explosionproof cement. Called Elmer's Non-flammable Contact Cement, the product uses a companion product, Elmer's Non-flammable Cleaner and Thinner, as solv-



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ent. Cement may be applied vertically or horizontally with brush or metal spreader. Uses include bonding of plastic, leather, linoleum, synthetic rubber and thin-gauge metal to plywood, pressed wood and other porous surfaces. It's available in quart and gallon containers.

•

Slow-Working Urethane: Dayton Rubber (Dayton, O.) has developed a new formulation that lengthens urethane foam reaction times from the 30-60-second range to 100-180 seconds. It's designed for use in producing rigid materials used in electronic components for aircraft, guided missiles, etc. Product is a two-component formulation of polyesters and isocyanates.

•

Bottoms-Up Bottle: Tidy Chemical Co. (Sunnyvale, Calif.) is now packaging its Ty-D-bol toilet bowl detergent in a bottle especially designed for upside-down dispensing. When the unit is placed in a toilet tank, an automatic dispenser in its bottleneck meters out an exact amount of product each time the tank refills. Bottle hangs in tank by a metal arm fitted around an indentation in the bottom of the bottle.

•

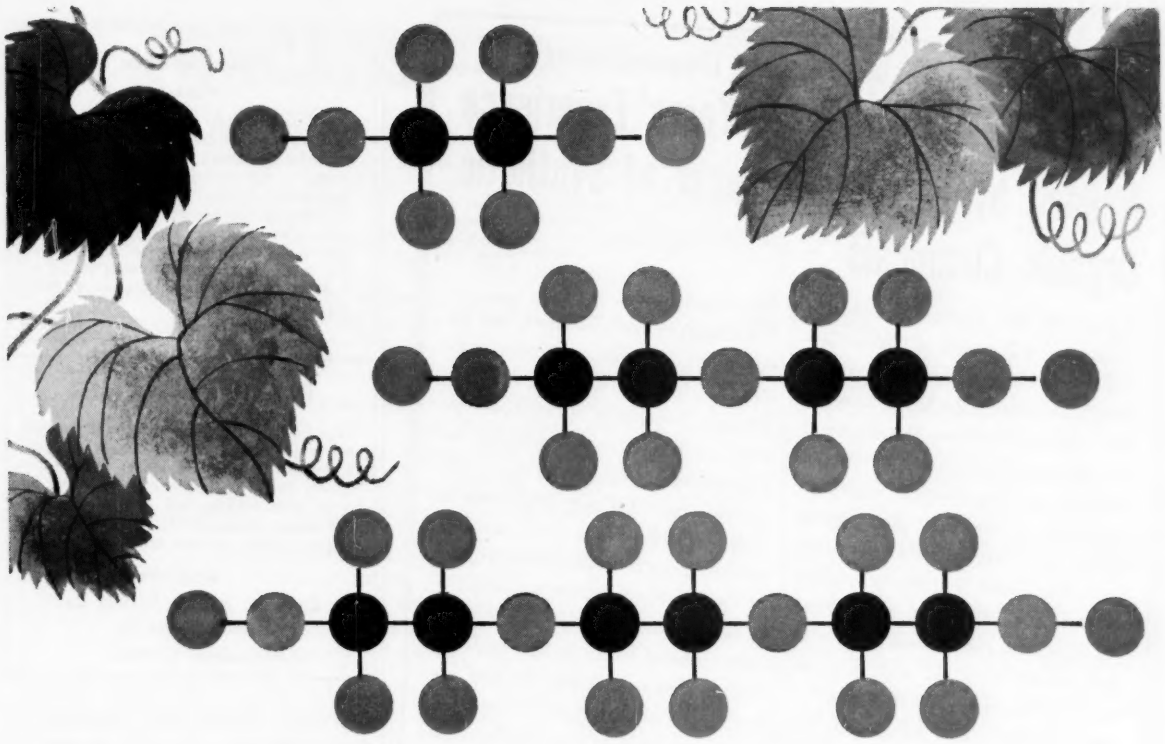
High-Temperature Lubricant: A new dry-film lubricant, formulated for drawing and forming of titanium, titanium alloys, chromium and stainless steels at elevated temperatures, consists of extremely fine particles of graphite combined with a high-temperature binder and dispersed in an aromatic solvent system. The material, Molykote 174X, which may be applied by either spray or brush, is a product of Alpha Molykote Corp. (Stamford, Conn.).

•

Liquid Thread: Clayton Specialty Mfg. (Chicago) is offering Miracle Magic Thread, a mending liquid. One drop is said to stop runs in nylon stockings. Material may be used on any type of clothing, awning or seat covers, rubber, leather, etc. Two-ounce glass bottle sells for $1.

•

Coating: Modified latex emulsions that combine cement and "cementitious" materials are now offered as coatings for interior and exterior structural surfaces. The concentrates are available from Surco International Corp. (Atlanta, Ga.).



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Extensive new facilities, to be completed in 1958, are under construction in South Charleston, West Virginia. Expansion of the Development staff is already underway in preparation for the greatly increased activity that these new facilities will make possible. Plans for expansion offer chances for rapid advancement in the Development Department.

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	Measurement of properties, reaction rates, ionization constants of organic compounds. Design of measurement equipment.
Organic Analysis	Functional group analysis organic chemistry—non-aqueous titrimetry—trace analysis.
Engineering Physics	Physical chemical measurement—methods of testing resins and resin solutions—rheological and other properties of high polymers.
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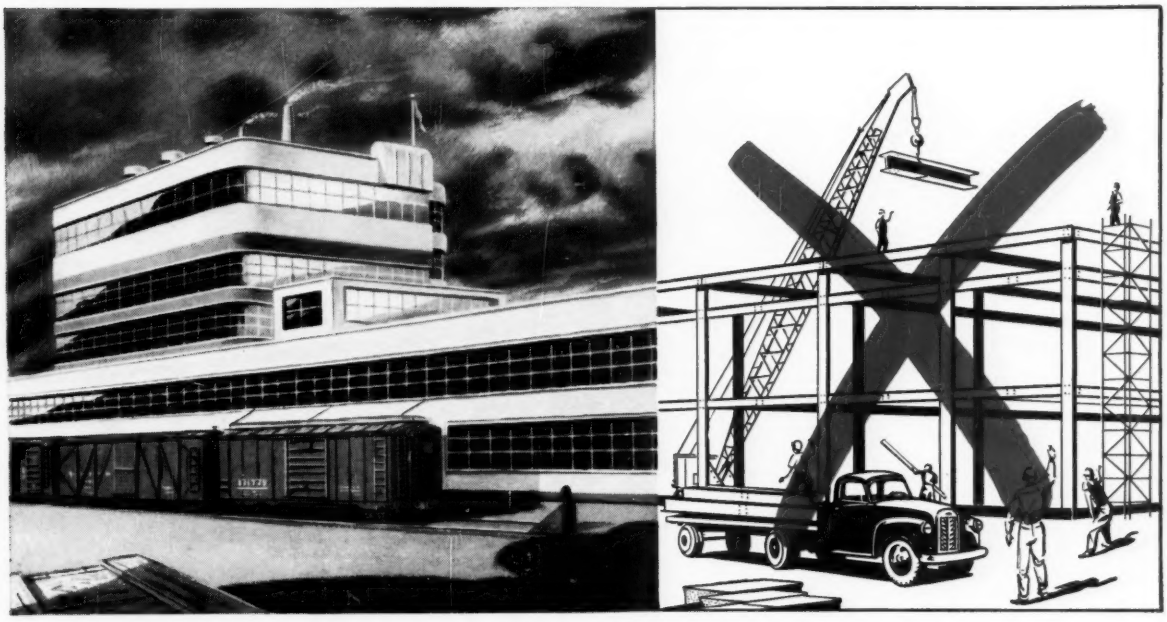

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